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OFFICIAL GAZETTE

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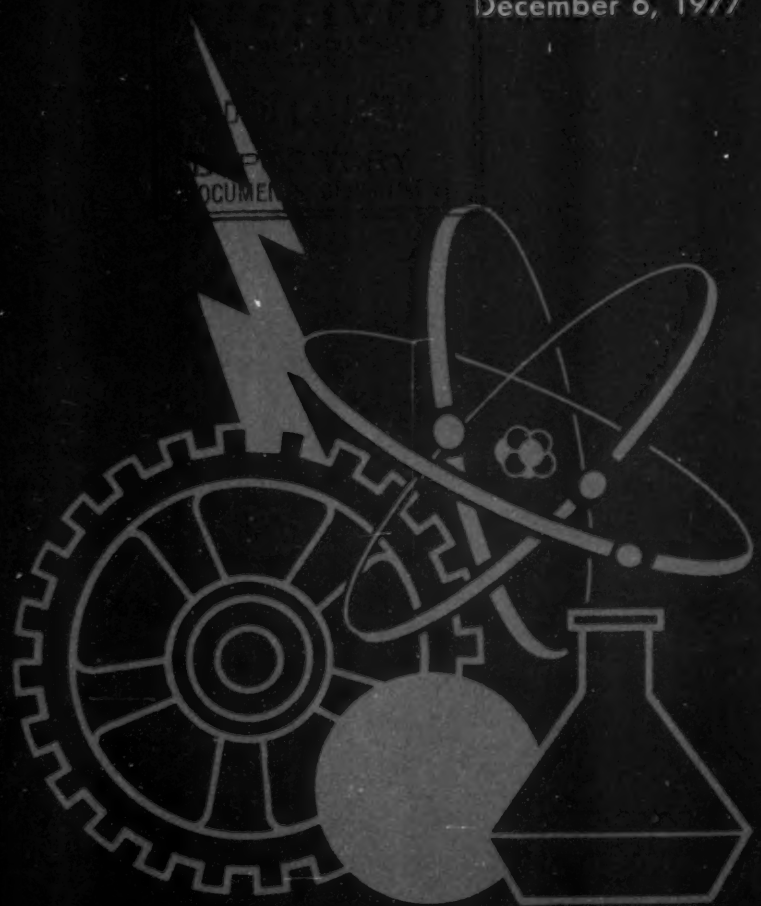
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

December 6, 1977



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

December 6, 1977 Volume 965 Number 1

CONTENTS

	Page
Patent and Trademark Notices	
Board of Appeals Decisions Rendered in October, 1977	965 OG 2
Reissue Applications Filed	965 OG 2
Patent Notices	
Certificates of Correction for the Week of December 6, 1977	965 OG 3
Disclaimers	965 OG 3
Dedications	965 OG 3
Patents Available for Licensing or Sale	965 OG 4
Errata	965 OG 5
Condition of Patent Applications	965 OG 6
Defensive Publications (T965,001)	1
Reissue Patents Granted (29,486)	3
Plant Patents Granted (4,161)	5
Patents Granted	
General and Mechanical (4,060,852)	7
Chemical (4,061,464)	213
Electrical (4,061,867)	321
Design Patents Granted (246,551)	389
Index of Patentees	PI 1
Cross Reference of Published Patent Applications Published Under Second Trial Voluntary Protest Program	PI 41
Indices of Applicants of Defensive Publications, Reissues, Plants and Designs	PI 49
Classification of	
Patents (Including Reissues)	PI 53
Designs, Plants and Defensive Publications	PI 55
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 56
Designs, Plants and Applicants of Defensive Publications	PI 57
Change of Address Form and Subscription Order Form	Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of October 1977

Affirmed	189
Affirmed in part	24
Reversed	60
Total	273

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,369,715, Re. S.N. 842,931, Filed Oct. 19, 1977, Cl. 222/333, SUBMERGED PUMPING SYSTEM, James C. Carter, Owner of Record: *International Telephone and Telegraph Corporation, New York, N.Y.,* Attorney or Agent: Paul W. Hemminger, et al., Ex. Gp.: 311

3,491,590, Re. S.N. 841,583, Filed Oct. 12, 1977, Cl. 73/141, POWER STOPPER WEIGHT TRANSFER APPARATUS, Billy K. Watkins, Owner of Record: *Inventor,* Attorney or Agent: Benjamin H. Sherman, et al., Ex. Gp.: 244

3,700,721, Re. S.N. 833,128, Filed Sept. 14, 1977, Cl. 260/470, SULFOPHENOXY MALONATE COMPOUNDS, John A. Rice, et al., Owner of Record: *Avtex Fobers Inc., Saint Media, Pa.,* Attorney or Agent: Arthur R. Eglington, et al., Ex. Gp.: 126

3,765,476, Re. S.N. 834,838, Filed Sept. 19, 1977, Cl. 165/16, TWO-RISER HEATING AND COOLING UNIT, James J. Whalen, Owner of Record: *Whalen Company, Laurel, Md.,* Attorney or Agent: Joseph M. Lane, et al., Ex. Gp.: 342

3,834,096, Re. S.N. 843,050, Filed Oct. 17, 1977, Cl. 52/172, INSULATING WALL UNIT, Otto Alfred Becker, Owner of Record: *Inventor,* Attorney or Agent: Thomas E. Beall, Jr., et al., Ex. Gp.: 354

3,847,569, Re. S.N. 834,703, Filed Sept. 19, 1977, Cl. 51/309, CABLE-TYPE SAW, Henry A. Snow, Owner of Record: *Inventor,* Attorney or Agent: Norman S. Blodgett, Ex. Gp.: 147

3,900,754, Re. S.N. 826,237, Filed Aug. 19, 1977, Cl. 313/221, ELECTRIC DISCHARGE LAMP, David Robert Mason, et al., Owner of Record: *Thorn Lighting Limited, London, England,* Attorney or Agent: Robert F. O'Connell, et al., Ex. Gp.: 252

3,906,877, Re. S.N. 835,233, Filed Sept. 21, 1977, Cl. 112/141, REINFORCED HEM FORMING DEVICE, John L. Rockerath, et al., Owner of Record: *Cluett, Peabody & Co., Inc., New York, N.Y.,* Attorney or Agent: John M. Prutzman, et al., Ex. Gp.: 353

3,908,770, Re. S.N. 836,328, Filed Sept. 26, 1977, Cl. 175/65, METHODS AND APPARATUS FOR DRIVING A MEANS IN A DRILL STRING WHILE DRILLING, Albert P. Richter, Jr., et al., Owner of Record: *Texaco, Inc., New York, N.Y.,* Attorney or Agent: Thomas H. Whaley, et al., Ex. Gp.: 354

3,909,286, Re. S.N. 838,354, Filed Sept. 30, 1977, Cl. 106/306, MODIFIED PRECIPITATED ALUMINO SILICATE PIGMENTS, Robert C. Fitton, Owner of Record: *J. M. Huber Corporation, Locust, N.J.,* Attorney or Agent: Harold H. Flanders, Ex. Gp.: 115

3,914,356, Re. S.N. 843,088, Filed Oct. 17, 1977, Cl. 264/40.5, METHODS OF AND APPARATUS FOR CONTROLLING THE THICKNESS OF AN ANNULAR EXTRUSION, Matthew R. Dembiak, et al., Owner of Record: *Western Electric Company, Inc., New York, N.Y.,* Attorney or Agent: S. I. Rosen, et al., Ex. Gp.: 147

3,917,471, Re. S.N. 843,130, Filed Oct. 17, 1977, Cl. 55/267, INSULATING FLEXIBLE COMPOSITE ELEMENT AND PURGE SYSTEM, Otto Alfred Becker, Owner of Record: *Inventor,* Attorney or Agent: Thomas E. Beall, Jr., et al., Ex. Gp.: 177

3,919,146, Re. S.N. 839,140, Filed Oct. 3, 1977, Cl. 260/23 EP, CAULKING COMPOSITION COMPRISING POLYMER HAVING ADDITION POLYMERIZED BACKBONE HAVING CARBOXYL GROUPS ESTERIFIED WITH DRYING OIL FATTY ACID GLYCIDYL ESTER, William D. Emmons, Owner of Record: *Rohm and Haas Company, Philadelphia, Pa.,* Attorney or Agent: George W. F. Simmons, et al., Ex. Gp.: 141

3,950,232, Re. S.N. 838,748, Filed Oct. 3, 1977, Cl. 210/281, UPFLOW FILTER, Edward J. Jordan, et al., Owner of Record: *Jet Aeration Company, Cleveland, Ohio,* Attorney or Agent: George V. Woodling, et al., Ex. Gp.: 176

3,955,835, Re. S.N. 843,125, Filed Oct. 17, 1977, Cl. 285/175, GAS ECONOMIZER, Percy L. Farrington, Owner of Record: *Inventor,* Attorney or Agent: Arnold S. Weintraub, Ex. Gp.: 353

3,960,248, Re. S.N. 835,056, Filed Sept. 21, 1977, Cl. 188/181 R, SPEED SENSING DEVICE, Leonard T. Tribe, Owner of Record: *Kelsey-Hayes Company, Romulus, Mich.,* Attorney or Agent: J. King Harness, et al., Ex. Gp.: 315

4,000,292, Re. S.N. 843,086, Filed Oct. 17, 1977, Cl. 424/272, 6-ARYLOXY-2-OXO-1-AZA-4-OXA (OR THIA)-SPIRO[4,5] DECANES, Roland Yves Mauvernay, et al., Owner of Record: *Centre Europeen de Recherches Mauvernar, Riom, France,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 125

4,017,759, Re. S.N. 841,230, Filed Oct. 11, 1977, Cl. 313/217, DISPLAY PANEL FOR DISPLAYING A BAR OF LIGHT, Donald E. Miller, Owner of Record: *Burroughs Corporation, Detroit, Mich.,* Attorney or Agent: Robert A. Green, Ex. Gp.: 252

4,022,605, Re. S.N. 839,758, Filed Oct. 5, 1977, Cl. 71/67, STABILIZED NON-MEDICAL FUNGICIDAL, BACTERICIDAL AND ALGICIDAL COMPOSITION, Kazumi Konya, et al., Owner of Record: *Kumiai Chemical Industry Company, Ltd., Tokyo, Japan,* Attorney or Agent: Norman F. Oblon, et al., Ex. Gp.: 173

PATENT NOTICES

Certificates of Correction for the Week of Dec. 6, 1977

Re. 29,199	4,017,761	4,033,582	4,041,135
Re. 29,363	4,019,142	4,033,826	4,041,452
3,670,183	4,019,421	4,034,139	4,041,472
3,755,323	4,019,531	4,034,413	4,041,483
3,819,795	4,021,224	4,034,960	4,041,848
3,844,832	4,021,296	4,035,028	4,041,853
3,884,916	4,022,617	4,035,146	4,042,166
3,900,283	4,022,719	4,035,309	4,042,330
3,912,255	4,023,079	4,035,405	4,042,715
3,912,909	4,023,338	4,035,475	4,042,744
3,920,575	4,023,510	4,035,602	4,043,344
3,924,003	4,023,622	4,035,643	4,043,502
3,924,018	4,023,929	4,035,973	4,043,736
3,924,523	4,024,117	4,036,301	4,044,061
3,927,013	4,024,163	4,036,389	4,044,382
3,928,648	4,024,222	4,036,427	4,044,487
3,939,270	4,024,398	4,036,629	4,044,621
3,948,172	4,024,492	4,036,657	4,044,830
3,956,500	4,024,807	4,036,833	4,045,234
3,957,922	4,026,892	4,037,248	4,045,240
3,958,033	4,027,245	4,037,684	4,045,304
3,959,356	4,027,284	4,037,880	4,045,377
3,962,321	4,028,385	4,037,888	4,045,610
3,965,977	4,028,712	4,038,075	4,045,947
3,969,329	4,028,945	4,038,097	4,046,005
3,969,363	4,029,189	4,038,112	4,046,013
3,980,071	4,029,769	4,038,127	4,046,022
3,984,441	4,029,778	4,038,131	4,046,130
3,985,531	4,030,377	4,038,163	4,046,163
3,988,464	4,030,446	4,038,227	4,046,223
3,992,099	4,030,474	4,038,265	4,046,536
3,992,537	4,030,476	4,038,421	4,046,933
3,993,461	4,030,576	4,038,570	4,046,956
3,996,749	4,030,996	4,038,916	4,047,076
3,996,844	4,031,006	4,038,950	4,047,222
3,999,782	4,031,087	4,039,003	4,047,226
4,000,247	4,031,221	4,039,013	4,047,227
4,001,023	4,031,224	4,039,027	4,047,268
4,001,825	4,031,369	4,039,074	4,047,355
4,003,148	4,031,461	4,039,302	4,047,381
4,003,226	4,031,579	4,039,381	4,047,444
4,004,137	4,031,664	4,039,534	4,047,463
4,004,139	4,031,748	4,039,553	4,048,015
4,005,930	4,031,764	4,039,600	4,048,169
4,006,128	4,032,085	4,039,823	4,048,807
4,008,711	4,032,143	4,039,825	4,048,911
4,008,789	4,032,487	4,040,001	4,049,744
4,008,925	4,032,608	4,040,312	4,049,793
4,010,250	4,032,710	4,040,624	4,050,048
4,013,020	4,032,818	4,040,680	4,050,050
4,013,599	4,032,838	4,040,798	4,054,440
4,017,170	4,032,982	4,040,875	4,054,693
4,017,429	4,033,150	4,040,948	4,055,652
4,017,619	4,033,336	4,041,130	

Disclaimers

3,292,117.—*John Bryant*, Birmingham, and *William A. Johnston*, Southfield, Mich. COAXIAL CONNECTOR WITH MEANS FOR PREVENTING AXIAL AND ROTATIONAL MOVEMENT BETWEEN CONNECTOR COMPONENTS. Patent dated Dec. 13, 1966. Disclaimer filed Aug. 8, 1977, by the assignee, *Omni-Spectra, Incorporated*.

Hereby enters this disclaimer to claims 13, 15, 16, 18 and 19 of said patent.

3,858,843.—*Leonard Joseph Hartmann*, Maplewood, Mo. BALL VALVE AND THE LIKE HAVING LOCKING HANDLE. Patent dated Jan. 7, 1975. Disclaimer filed Sept. 28, 1977, by the assignee, *Chemetron Corporation*.

Hereby enters this disclaimer to all claims of said patent.

3,937,411.—*Charles A. Vogel*, and *William T. Lombardi*, San Jose, Calif. TAPE ROLL HOLD-DOWN DEVICE. Patent dated Feb. 10, 1976. Disclaimer filed Oct. 5, 1977, by the assignee, *American Videonetics Corporation*.

Hereby enters this disclaimer to claims 1–3 and 6–7 of said patent.

3,942,632.—*Robert S. Witkoff*, Glen Cove, N.Y. JEWELRY BOX. Patent dated Mar. 9, 1976. Disclaimer filed Aug. 24, 1977, by the assignee, *The Alsten Company*.

The term of this patent subsequent to Dec. 30, 1989, has been disclaimed.

3,981,265.—*Paul B. Gilbert*, Chicago, Ill. COMBINED DIAL SCALE AND STATION INDICATOR. Patent dated Sept. 21, 1976. Disclaimer filed Sept. 29, 1977, by the assignee, *Motorola, Inc.*

Hereby enters this disclaimer to claims 9 through 14 inclusive of said patent.

Dedication

3,836,651.—*Harry W. Rudel* and *Fred A. Kincl*, New York, N.Y. NOVEL ORAL CONTRACEPTIVE COMBINATION. Patent dated Sept. 17, 1974. Dedication filed Oct. 3, 1977, by the assignee, *Biological Concepts, Inc.*

Hereby dedicates to the Public the entire remaining term of said patent.

Patents Available for Licensing or Sale

D. 242,949. FONT OF TYPE. Stephen Earl Diamond, P.O. Box 99238, San Francisco, Calif. 94109.

D. 245,044. DIRECTIONAL LIGHTING SYSTEM. Dorothy F. Pollack, 6026 Declaration Circle, Citrus Heights, Calif. 95610.

3,643,957. GAME BOARD APPARATUS. Clifford F. Bryant, 1512 Oberlin St., Pittsburgh, Pa. 15206.

3,658,895. PREPARATION OF CONCENTRATED ACRYLIC ACID BY TREATMENT WITH A MINERAL ACID AND DUAL STAGE DISTILLTION. Inquiries are to be addressed to: Donald R. Bentz, Esq., Curtis, Morris & Safford, P. C., 530 Fifth Ave., New York, N.Y. 10036.

3,785,538. FINGER-ACTUATED SNAP OPEN CAPS FOR BOTTLES, COLLAPSIBLE TUBES AND THE LIKE. Anthony J. Cocovella, 23 Wyman Road, Braintree, Mass. 02184.

3,785,631. THE PARTING AND BEVEL BURNING DEVICE. Stanley Peter Prye, 2222 Barnard, Houston, Tex. 77098.

3,841,686. PET WASTE PICKUP DEVICE. Joseph Gallo and Lillian Fletcher, 7011 Willoughby Ave., Hollywood, Calif. 90038.

3,899,157. TACK FASTENER AND STRIPPER. Robert Thomas, 30 West Chicago Ave., Chicago, Ill. 60610.

3,920,930. FIELD EFFECT RECORDING AND SEMICONDUCTOR PLAYBACK DEVICES. John J. Sobczyk, 112 3rd St. #c, Seal Beach, Calif. 90740.

3,938,827. SIDE BY SIDE BIKES ASSEMBLY INSTRUCTIONS. Chas. L. Johnson, 4235 McDowell Space 100, Phoenix, Ariz. 85008.

3,953,988. REFRIGERATION METHOD AND REFRIGERATION APPARATUS FOR CARRYING OUT THE METHOD. Ernst Sander, Correspondence to: Craig, Antonelli, 900 Watergate Office Bldg., 2600 Virginia Ave. NW., Washington, D.C. 20037.

4,016,667. SIDE SPRING DOOR ACTION. John Forbes, Box 355, Newport, N.H. 03773.

4,024,682. A-FRAME BUILDING. Billy H. Jamison, Sherman, Tex., Correspondence to: Michael A. O'Neil, 2900 One Main Place, Dallas, Tex. 75250.

4,031,681. WALL CONSTRUCTION. Joseph Charniga, Box 292, New Middletown, Ohio 44442.

4,034,489. HEATED SNOW SHOVEL. John F. Hughes, Jr., Route 112, Saco, Maine 04072.

4,034,685. PRECISION CIRCULAR BLADE GRINDING MACHINE. Will Lustgraaf, 124 Glacier Drive, Lolo, Mont. 59847.

4,037,581. SCREEN DEVICE FOR STOVE OVENS. Thomas Trifletti, Albany, N.Y. Corresponence to: Frederick L. Bergert, Crystal Square No. 5, 1755 Jefferson Davis Hwy., Arlington, Va. 22202.

4,040,313. TELLER SHIELD. James O. Word, 207 Sixth Ave., Hattiesburt, Miss. 39401.

4,043,316. MODULAR DIRECT SOLAR HEAT WINDOW UNIT. Asa S. Arent, M.D., Humboldt, Iowa 50548.

4,045,077. CONVERTRA-BIKE-TOP. James DeVone, Durham, N.C., Correspondence to: DeVone Manufacturing Company, Post Office Box 1285, Durham, N.C. 27702.

4,046,393. PORTABLE ALED. Kenneth Vadnais, Correspondence to: James M. Delmen, 407 N. Main St. 100, Ann Arbor, Mich. 48104.

4,049,009. APPARATUS FOR TRIMMING THE NAILS. Florian Marchand, Correspondence to: George Marchand S.A., CH 2738 Court BE, Switzerland.

The following two patents are offered by CRAFT HOUSE CORPORATION, % Henry K. Leonard, 700 Toledo Bldg., 316 North Michigan, Toledo, Ohio 43624.

3,582,557. BURGLAR AND FIRE ALARM.

3,641,552. CENTRALLY LOCATED ACCESS ALARM SYSTEM.

The following two patents are offered by John O. Richards, 980 Mill Circle Apt. #99, Alliance, Ohio 44601.

3,578,840. REVOLVING REFLECTOR.

3,835,507. ROPE HOLDING DEVICE.

The General Electric Company is prepared to grant nonexclusive licenses under the following patents on reasonable terms to domestic manufacturers.

Applications for licenses may be addressed to: Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa. 19142.

3,814,620. METHOD OF APPLYING A FUSED SILICA COATING TO A SUBSTRATE.

4,048,348. METHOD OF APPLYING A FUSED SILICA COATING TO A SUBSTRATE.

Applications for licenses may be addressed to the Division Patent Counsel, Electronic Systems Division, General Electric Company, Building 3, Room 216, Electronics Park, Syracuse, N.Y. 13201.

3,955,619. HEAT TRRANSFER DEVICE.

3,956,728. SIGNAL CORRELATION SYSTEM.

3,968,490. RADAR MTI PROCESSOR WITH CFAR.

3,974,474. UNDERWATER ELECTROACOUSTIC TRANSDUCER CONSTRUCTION.

Applications for licenses may be addressed to Patent Counsel, Turbine Operations, Turbine Patent Operation, General Electric Company, 1 River Road, Building 18A–5th Floor, Schenectady, N.Y. 12345.

3,158,607. RELAY FOR LOW-SPEED SENSING SYSTEM.

3,260,116. REMOTE READING TEMPERATURE INDICATING SYSTEM.

3,407,638. METHOD FOR FORMING SERRATED OR CORRUGATED HOLLOW TUBES.

3,614,255. THRUST BALANCING ARRANGEMENT FOR STEAM TURBINE.

3,712,272. COMBINED MOISTURE SEPARATOR AND REHEATER.

3,752,599. BUCKET VIBRATION DAMPING DEVICE.

3,853,327. SELF-PRESSURIZING SHAFT SEAL.

4,039,872. GUIDE VANE ASSEMBLY FOR REVERSE FLOW COOLED DYNAMOELECTRIC MACHINE.

Application for license may be addressed to the Patent Counsel, Mobile Radio Prods. Dept., General Electric Company, Lynchburg, Va. 24502.

4,038,605. MESSAGE PREAMBLE DETECTOR.

Application for license may be addressed to the General Electric Company, Construction Materials Division, 100 E. Carmel Drive, Suite 205, Carmel, Ind. 46032.

3,869,639. EMERGENCY LIGHTING SYSTEM USING DIM TO BRIGHT FLASHING OPERATION.

4,019,102. A SUCCESSIVE APPROXIMATION FEEDBACK CONTROL SYSTEM.

4,027,228. PHOTOCUPLED ISOLATED SWITCHING AMPLIFIER CIRCUIT.

General Motors Corporation is prepared to grant non-exclusive licenses under the following patents upon reasonable terms.

Applications for licenses may be addressed to the Director, Patent Section, General Motors Building, 3044 W. Grand Blvd., Detroit, Mich. 48202.

3,861,241. TRANSMISSION WITH SPEED RESPONSIVE SHIFTING IN REVERSE GEARS.

3,884,583. METHOD AND APPARATUS FOR MAGNETICALLY MODULATED RESONANCE ANALYSIS OF GAS.

3,889,780. GREASE RETAINER FOR ENGAGED SPLINES.

3,896,365. POWER CENTER INVERTER HAVING POWER CENTER COMMUTATION DURING OPERATION INTO SHORT CIRCUITS.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

4,039,370. OPTICALLY MONITORING THE UNDERCUTTING OF A LAYER BEING ETCHED.

4,039,838. HIGH RESOLUTION FLUORESCENT SCREEN AND METHODS OF MAKING AND USING THE SAME.

4,039,857. DYNAMIC BIASING OF ISOLATION BOAT INCLUDING DIFFUSED RESISTORS.

4,039,858. TRANSITION DETECTOR.

4,039,862. LEVEL SHIFT CIRCUIT.

4,039,869. PROTECTION CIRCUIT.

4,039,887. ELECTION EMITTER INCLUDING POROUS ANTIMONY.

4,040,029. MEMORY SYSTEM WITH REDUCED BLOCK DECODING.

4,040,076. CHARGE TRANSFER SKIMMING AND RESET CIRCUIT.

4,040,088. ADAPTOR FOR INTER-RELATING AN EXTERNAL AUDIO INPUT DEVICE WITH A STANDARD TELEVISION RECEIVER AND AN AUDIO RECORDING FOR USE THEREWITH.

4,040,089. DISC MASTER POSITIONING APPARATUS FOR A RECORDING SYSTEM.

4,040,092. SMEAR REDUCTION IN CCD IMAGERS.

4,040,168. FABRICATION METHOD FOR A DUAL GATE FIELD EFFECT TRANSISTOR.

4,040,634. OVERHEAD DISC RECORD GROUNDING APPARATUS.

4,040,635. RELEASABLE STYLUS ARM MAGNETIC COUPLING.

4,041,307. POSITIONING A PLATFORM WITH RESPECT TO RAYS OF A LIGHT SOURCE.

4,041,342. ELECTRON MULTIPLE WITH BEAM CONFINEMENT STRUCTURE.

4,041,347. CATHODE-RAY TUBE HAVING CONDUCTIVE INTERNAL COATING EXHIBITING REDUCED GAS ABSORPTION.

4,041,354. PINCUSHION CORRECTION CIRCUIT.

4,041,357. HIGH VOLTAGE PROTECTION CIRCUIT.

4,041,374. INTERELECTRODE OPEN AND SHORT CIRCUIT TESTER.

4,041,388. TRANSISTOR CIRCUIT.

4,041,408. PUSH-PULL AUDIO AMPLIFIER SYSTEM WITH MUTING.

4,041,486. PULSE STREAM IDENTIFICATION CIRCUIT.

4,041,515. AVALANCHE TRANSISTOR OPERATING ABOVE BREAKDOWN.

4,041,531. TELEVISION SIGNAL PROCESSING APPARATUS INCLUDING A TRANSVERSAL EQUALIZER.

4,041,775. VIBROMETER.

4,042,293. LIQUID CRYSTAL DEVICES HAVING DIODE CHARACTERISTICS.

4,042,382. TEMPERATURE-STABLE NON-MAGNETIC ALLOY.

4,042,841. SELECTIVELY POWERED FLIP-FLOP.

4,044,313. PROTECTIVE NETWORK FOR AN INSULATED-GATE FIELD-EFFECT (IGFET) DIFFERENTIAL AMPLIFIER.

4,044,341. MEMORY ARRAY.

4,044,375. BRIGHTNESS CONTROL APPARATUS.

4,044,379. METHOD AND APPARATUS FOR ELECTRO-MECHANICAL RECORDING OF SHORT WAVELENGTH MODULATION IN A METAL MASTER.

4,045,133. ANALOG OPTICAL BLOCK PROCESSOR.

4,045,250. METHOD OF MAKING A SEMICONDUCTOR DEVICE.

4,045,318. METHOD OF TRANSFERRING A SURFACE RELIEF PATTERN FROM A POLY(OLEFIN SULFONE) LAYER TO A METAL LAYER.

4,045,688. POWER-ON RESET CIRCUIT.

4,045,694. CURRENT DIVIDER.

4,045,719. REGULATED VOLTAGE SOURCE.

4,045,746. ADJUSTABLE GAIN CURRENT AMPLIFIERS.

4,045,747. COMPLEMENTARY FIELD EFFECT TRANSISTOR AMPLIFIER.

4,045,811. SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE INCLUDING AN ARRAY OF INSULATED GATE FIELD EFFECT TRANSISTORS.

4,045,822. GROUND FAULT INTERRUPTER APPARATUS.

4,045,849. METHOD FOR ASSEMBLING A THERMALLY-SET GETTER SPRING IN A CRT.

4,046,384. STYLUS CLEANING SYSTEM FOR DISC RECORD PLAYER.

4,046,606. SIMULTANEOUS LOCATION OF AREAS HAVING DIFFERENT CONDUCTIVITIES.

4,047,054. THYRISTOR SWITCHING CIRCUIT.

4,047,057. MONOSTABLE SWITCHING CIRCUIT.

4,047,059. COMPARATOR CIRCUIT.

4,047,196. HIGH VOLTAGE SEMICONDUCTOR DEVICE HAVING A NOVEL EDGE CONTOUR.

4,048,544. SWITCHED VERTICAL DEFLECTION SYSTEM.

4,048,597. PLANAR PRINTED CIRCUIT BOARD ARRANGEMENT USEFUL IN THE UHF PORTION OF A TELEVISION TUNER.

4,048,598. UHF TUNING CIRCUIT UTILIZING A VARACTOR DIODE.

4,048,627. ELECTROLUMINESCENT SEMICONDUCTOR DEVICE HAVING A RESTRICTED CURRENT FLOW.

4,049,280. PICKUP CARTRIDGE.

4,049,451. METHOD FOR FORMING A COLOR TELEVISION PICTURE TUBE SCREEN.

4,049,452. REVERSE-PRINTING METHOD FOR PRODUCING CATHODE-RAY-TUBE-SCREEN STRUCTURE.

4,049,459. ORGANIC VOLUME PHASE HOLOGRAPHIC RECORDING MEDIUM.

4,049,845. METHOD FOR PREPARING FILTER-COATED PHOSPHOR PARTICLES.

4,049,872. GLASS FRIT COMPOSITION FOR SEALING WINDOW GLASS.

4,049,977. PHASE-SPLITTER.

4,049,994. LIGHT EMITTING DIODE HAVING A SHORT TRANSIENT RESPONSE TIME.

4,050,018. CAPACITANCE METER BIAS PROTECTION CIRCUIT.

4,050,071. BI-STATIC RADAR SPEED SENSOR.

4,050,967. METHOD OF SELECTIVE ALUMINUM DIFFUSION.

4,051,391. CURRENT-OPERATED CIRCUITS AND STRUCTURES.

4,051,392. CIRCUIT FOR STARTING CURRENT FLOW IN CURRENT AMPLIFIER CIRCUITS.

4,051,441. TRANSISTOR AMPLIFIERS.

4,051,447. RADIO FREQUENCY COUPLER.

4,051,468. APPARATUS AND METHOD FOR MODULATING A FLAT PANEL DISPLAY DEVICE.

4,051,510. HUE CORRECTION APPARATUS CONTROLLED BY CHROMINANCE SATURATION.

4,051,518. BURST GATE PULSE GENERATOR.

4,051,519. PHASE CONTROL CIRCUIT SUITABLE FOR USE IN A TINT CONTROL STAGE OF A COLOR TELEVISION SYSTEM.

4,051,521. VIDEO AMPLIFIER FOR COMBINING LUMINANCE AND CHROMINANCE SIGNALS.

E. I. du Pont de Nemours and Company, assignee, hereby irrevocably offers to grant a royalty-free, irrevocable license under U.S. Patent 3,988,883 issued to Benjamin Chiatze Sze on Stretch-Resistant Bulked Yarn.

Requests for a license under this patent should be directed to: Director of Patent Liaison & Research Services, Textile Fibers Department, E. I. du Pont de Nemours and Company, Wilmington, Del. 19898.

Errata

All reference to Patent No. 4,046,585 to Kuo-Cheng Shen of Canada for Composition and Method for Binding Lignocellulosic Materials appearing in the OFFICIAL GAZETTE of September 6, 1977 should be deleted since no patent was granted.

All reference to Patent No. 4,053,055 to Edward Albert Tarbox of Illinois for A Dispensing Package appearing in the OFFICIAL GAZETTE of October 11, 1977 should be deleted since no patent was granted.

All reference to Patent No. 4,057,314 to Istvan Mathe and Alan Henry Kasper of Illinois for Electrical Connector Including Insulation-Opening Contact appearing in the OFFICIAL GAZETTE of November 8, 1977 should be deleted since no patent was granted.

Special Erratum

Reference to Patent No. 4,031,304 in the Errata appearing in the OFFICIAL GAZETTE of July 5, 1977 (960 O.G. 5) is clarified as follows: Patent No. 4,031,304 was correctly issued on June 21, 1977. However, this patent issued to Brian Bannister of Kalamazoo, Michigan. No patent was granted to Richard W. Neuzil et al. of Illinois on June 21, 1977.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 19, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-2-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-14-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-8-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	11-26-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas: Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-3-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	8-18-76
SPECIAL LAWS ADMINI[illegible]ATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and [illegible]munition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-2-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-24-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-5-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	7-9-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-6-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-28-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	4-1-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	11-8-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	11-22-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	3-31-77

Expiration of patents: The patents within the range of numbers indicated below expire during November 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,958,082 to 2,962,719, inclusive
Plant Patents..... Numbers 1,978 to 1,990, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED DECEMBER 6, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T965,001
DYESTUFF WASTE WATER PURIFICATION

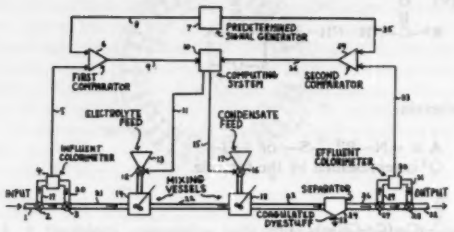
John N. Carbone, 3416 Winchester Drive; George S. Dominguez, 904 Chatfield Drive, and Jayanti V. Isharani, 803 Coronado Drive, all of Greensboro, N.C. 27410

Continuation of Ser. No. 600,534, July 31, 1975, abandoned. This application Feb. 15, 1977, Ser. No. 768,915

Int. Cl.² C02B *1/20*

U.S. Cl. 210—52

No Drawing. 19 Pages Specification



This invention relates to the purification and clarification of a dyestuff and pigment colored waste water by contacting said waste water with an effective amount of a condensation product of formaldehyde and dicyandiamide, and an electrolyte, to coagulate said dyestuff, and removing the resultant coagulate from the waste water.

T965,002
STEAM TREATMENT OF VULCANIZED-SCRAP-RUBBER PYROLYSIS CHAR

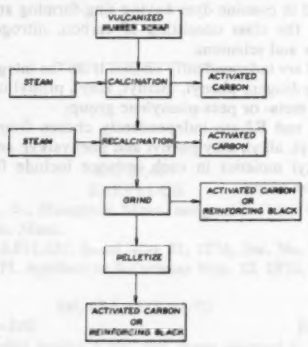
Grant Crane, and Edward L. Kay, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 709,030, July 27, 1976, abandoned, which is a continuation of Ser. No. 493,438, July 24, 1974, abandoned. This application Feb. 7, 1977, Ser. No. 766,834

Int. Cl.² C01B *31/10*; B01J *21/18*

U.S. Cl. 252—421

3 Sheets Drawing. 18 Pages Specification



Scrap rubber is pyrolyzed in the substantial absence of air and treated with steam. The steam treatment can be carried out simultaneously with the pyrolysis or subsequently or it may be carried out both in part simultaneously with the pyrolysis and subsequently. Different products are obtained.

T965,003
PROCESS FOR COATING A PIPE

Joannes C. A. Schellekens, and Eric J. Van Beem, both of Amsterdam, Netherlands, assignors to Shell Oil Company

Filed Feb. 22, 1977, Ser. No. 770,500

Claims priority, application United Kingdom, Mar. 5, 1976, 8907/76

Int. Cl.² B05D *1/36, 7/14*; B32B *1/08*

U.S. Cl. 427—409

No Drawing. 10 Pages Specification

A process for coating a pipe, tube, or conduit is disclosed, which process consists of applying to the article a bituminous composition comprising:

a. from 80 to 99 parts by weight of a bituminous component;
b. from 1 to 20 parts by weight of a block copolymer having the general structure $A—B\left(-B—A\right)_n$ where A is thermoplastic polymer block of a monoalkenyl arene, B is an elastomeric polymer block of a conjugated diene, and n is an integer from 1-15;
c. from 1 to 60 percent by weight of a wax; and
d. from 1 to 100 percent by weight of an inorganic filler wherein the percentages of wax and filler are based on the combined weight of the bituminous component and the block copolymer.

T965,004
TREATMENT OF TRANSITION METAL COMPOUND AS COMPONENT FOR OLEFIN POLYMERIZATION CATALYST

Anthony David Caunt, 1 Templewood, Welwyn Garden City, Hertfordshire, England

Filed Apr. 18, 1977, Ser. No. 788,642

Claims priority, application United Kingdom, May 7, 1976, 18787/76

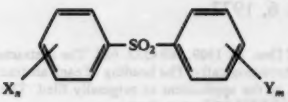
Int. Cl.² C08F *4/66, 10/06*

U.S. Cl. 526—128

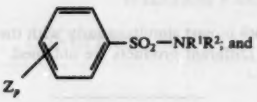
No Drawing. 33 Pages Specification

A ground product suitable for use as a component of an olefine polymerization catalyst in which a solid compound of a transition metal, for example a titanium trichloride-containing product such as a $TiCl_3—AlCl_3$ composition, is ground with a minor portion of an organo-phosphorus or organo-silicon compound and is also contacted with a minor portion of a specified organo-sulfur compound. A minor portion includes from at least 0.01 and not more than 1 mole of the organic compound for each gram atom of transition metal which is present in the solid component of the transition metal. The organophosphorus compound can be a trihydrocarbyl phosphine or phosphine oxide, such as tributylphosphine or triphenylphosphine. The organo-silicon compound can be an organo-silane, a siloxane or a compound containing at least one Si-N bond, for example a methylsiloxane compound.

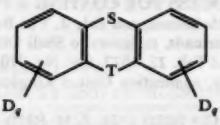
Preferably, the sulfur-containing organic compound may be selected from sulphone compounds of the formula:



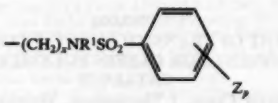
sulphonamide compounds of the formula:



sulphide compounds of the formula:



where X is a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio or arylthio group, or a group —NRR[1], or two groups X can together form a saturated or unsaturated hydrocarbon ring; and Y is a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group —NRR[1], or two groups Y can together form a saturated or unsaturated hydrocarbon ring; or a group X and a group Y may be replaced by a link between the two phenyl groups attached to the $—SO_2—$ group, the linkage being either direct or through a group —O—, $—CH_2—$, —NR—, —S—, or —CO—; Z is a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group —NRR[1], or two groups Z can together form a saturated or unsaturated hydrocarbon ring; D is a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio or arylthio group, or a group —NRR[1]; T is —S—, —O—, —NR[1]—, or —CO—; R is a hydrogen atom or a hydrocarbyl group; R[1] is a hydrocarbyl group; R[2] is a hydrocarbyl group or it can be the group:



n, *m*, *p* and *q* are each, independently, an integer from **0** up to **5**; and *x* is a positive integer.

The organo-sulfur compound is an aromatic sulphone, sulphonamide or heterocyclic sulfur compound, for example, diphenylsulphone, or phenoxathiin.

Contacting with the organo-sulfur compound can be effected by grinding for example in a ball mill, and all of the materials can be ground together. A metal halide such as titanium tetrachloride may also be present during the grinding step.

Olefine polymerization catalyst systems which include as a component thereof the transition metal/specific organo-sulfur compound are also disclosed.

T965,005

NUCLEATING AGENTS, RADIATION-SENSITIVE COMPOSITIONS AND PHOTOGRAPHIC ELEMENTS

Ronald E. Leone, and James K. Elwood, both c/o Kodak Park Division, Rochester, N.Y. 14650

Division of Ser. No. 700,981, June 29, 1976. This application Feb. 14, 1977, Ser. No. 768,519

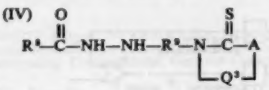
Int. Cl.[2] C09B *23/00*; C07D *275/04*

U.S. Cl. 542—429

No Drawing. 65 Pages Specification

Heterocyclic N-(acylhydrazinophenyl)thioamide nucleating agents are disclosed as well as radiation-sensitive compositions and elements containing such nucleating agents in combination with silver halide grains capable of forming an internal latent image. The elements can be used to form direct-positive photographic images. Dye image transfer photographic elements are specifically contemplated. A specifically preferred compound class comprised of a combination of preferred moieties can be indicated by the formula:

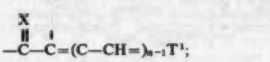
(IV)



wherein:

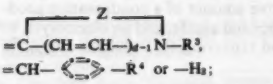
A is =N—R[3], —S— or —O—;

Q[3] is represented by the formula



X is =S or =O;

T[1] is



R[3] is an alkyl substituent:

R[4] is hydrogen, an alkyl,

or an alkoxy substituent;

Z represents the non-metallic atoms necessary to complete a basic 5- or 6-membered heterocyclic nucleus of the type found in cyanine dyes having ring-forming atoms chosen from the class consisting of carbon, nitrogen, oxygen, sulfur and selenium;

n and *d* are independently chosen from the integers 1 and 2;

R[5] is hydrogen, phenyl, methyl, ethyl, propyl or butyl;

R[3] is a meta- or para-phenylene group;

R[2], R[5] and R[6] are independently chosen from hydrogen, phenyl, alkyl, alkylphenyl and phenyalkyl; and

the alkyl moieties in each instance include from 1 to 6 carbon atoms.

REISSUES

DECEMBER 6, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

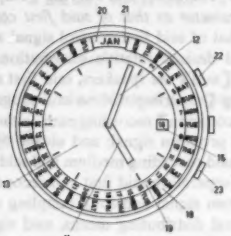
Re. 29,486
TIMEPIECE

Irving L. Wein, Chicago, Ill., assignor to Clinton Watch Company, Chicago, Ill.

Original No. 3,760,585, dated Sept. 25, 1973, Ser. No. 179,988, Sept. 13, 1971. Application for reissue Nov. 29, 1974, Ser. No. 528,212

Int. Cl.² G04B *39/00, 19/06*

U.S. Cl. 58—91 3 Claims



1. A timepiece, comprising indicating means driven by a movement, said indicating means including hands for indicating the hours and minutes and a date ring for indicating the date, characterized in that there are disposed around the said indicating means within the casing of the timepiece a first annular surface carrying indications of the dates of a month of 31 days, a second annular surface concentric with the first one and carrying indications of the consecutive days of the week of at least five consecutive weeks, at least one of said annular surfaces being stationary and having window formed therein, the other of said annular surfaces being disposed on a turning ring which can be rotated manually for radially aligning the indications of the dates and the indications of the days of the week, and a third annular surface carrying indications of the 12 months of the year, said third annular surface being disposed on a turning ring which can be manually rotated for presenting one of the twelve month indications in the window of said at least one stationary annular surface, said surfaces cooperating to form a complete calender of a month.

Re. 29,487
EARPLUGS

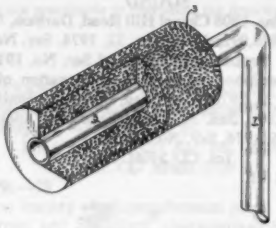
Ross Gardner, Jr., Stoughton, Mass., assignor to Cabot Corporation, Boston, Mass.

Original No. 3,811,437, dated May 21, 1974, Ser. No. 192,366, Oct. 26, 1971. Application for reissue Mar. 12, 1976, Ser. No. 666,364

Int. Cl.² A61F *11/02*

U.S. Cl. 128—152 19 Claims

11. An earplug having a size and shape adapted to be compressed and inserted into the human ear canal and there allowed to expand and obturate the ear canal, said earplug comprising a resilient plasticized polymeric foam having a sufficiently high concentration of organic plasticizer therein as to provide said foam with a rate of recovery from 60 percent compression thereof to 40 percent compression thereof of from 1 to 60 seconds and an



equilibrium pressure at 40 percent compression thereof of from 0.2 to 1.3 p.s.i.

Re. 29,488
FUEL COMPOSITIONS AND ADDITIVE MIXTURES FOR ALLEVIATION OF EXHAUST GAS CATALYST PLUGGING

Marcellan F. Gautreaux, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Original No. 3,926,580, dated Dec. 16, 1975, Ser. No. 483,641, June 27, 1974. Application for reissue Sept. 30, 1976, Ser. No. 728,398

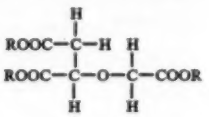
Int. Cl.² C10L *1/18*

U.S. Cl. 44—68 40 Claims

1. As a composition of matter, a gasoline for an internal combustion engine comprising

i. about 0.005 -10 grams of manganese per gallon as a cyclopentadienyl manganese tricarbonyl wherein said cyclopentadienyl group is a hydrocarbon group containing 5–17 carbon atoms, and

ii. amount sufficient to reduce the plugging of an exhaust gas catalyst of a compound having the general formula:



wherein R is independently selected from hydrogen and hydrocarbyl radicals.

Re. 29,489
BIPHENYL SULPHONES

Alan Branford Newton, Welwyn Garden City; John Brewster Rose, Letchworth, both of England, and Victor Jeffrey Leslie, Wilmington, Del., assignors to Imperial Chemical Industries Limited, London, England

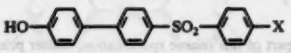
Original No. 3,862,990, dated Jan. 28, 1975, Ser. No. 374,977, June 29, 1973. Division of Ser. No. 186,795, Oct. 5, 1971, Pat. No. 3,764,583, which is a continuation-in-part of Ser. No. 60,101, July 31, 1970, abandoned. Application for reissue Dec. 13, 1976, Ser. No. 750,159

Claims priority, application United Kingdom, July 31, 1969, 38438/69

Int. Cl.² C07C *147/10*

U.S. Cl. 260—607 AR 2 Claims

2. A halophenol [according to claim 1] of the formula



or an alkali metal salt thereof wherein X is halogen.

Re. 29,490

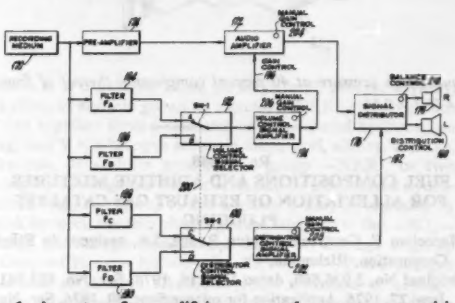
SYSTEM FOR ELECTRONIC MODIFICATION OF SOUND

Ramzi A. Shamma, 1808 Chapel Hill Road, Durham, N.C. 27707

Original No. 3,848,092, dated Nov. 12, 1974, Ser. No. 375,366, July 2, 1973. Continuation-in-part of Ser. No. 191,632, Oct. 22, 1971, abandoned, which is a continuation of Ser. No. 74,869, Sept. 23, 1970, abandoned, which is a continuation of Ser. No. 701,987, Jan. 31, 1968, abandoned. Application for reissue Oct. 6, 1976, Ser. No. 730,066

Int. Cl.[2] H04C *3/12*

U.S. Cl. 179—1 VL **8 Claims**



1. A system for modifying a sound program comprising means for providing an audio signal; means for amplifying said audio signal and presenting the same as an output signal; signal distributing means connected to said amplifying means for dividing said output signal into two parts [a first speaker connected to said signal distributing means for receiving one of said output signal parts; a second speaker spaced from said first speaker and connected to said signal distributing means for receiving the other of said output signal parts,] *for distribution to first and second spaced speakers;* said signal distributing means including means for increasing the relative amplitude of one of said parts while decreasing the relative amplitude of the other of said parts; said audio signal providing means comprising a recording medium having a program signal within the audio frequency range and a first control signal [having a first frequency outside of the audio frequency range and] having a first preselected and varying [amplitude] pattern *of a parameter thereof* corresponding to a first desired relative distribution of said output signal between [said] *the* speakers, and a second control signal [at a second frequency outside the audio frequency range and different than said first frequency and] having a second preselected and varying [amplitude] pattern *of the same parameter as that of said first control signal and* different than that of said first control signal and corresponding to a second desired relative distribution of said output signal between [said] *the* speakers, said first and second control signals being [superimposed on said program signal and] recorded on a [common] recording path on *the same* recording medium as said program signal; and means operatively interposed between said recording medium and said signal distributing means for [separating said first and second control signals from said program signal and for] coupling said control signals to said signal distributing means, said signal distributing means further including means for selectively applying only one of said first and second control signals to said amplitude decreasing and increasing means, said signal distributing means being responsive to the [amplitude] *variations of said parameter* of said one of said control signals to vary the relative amplitudes of said parts of said output signal in accordance with the varying [amplitude] patterns of *said parameter of* said one of said control signals, whereby a controlled shifting movement of the apparent sound between [said] *the* first and second speakers is created.

PLANT PATENTS

GRANTED DECEMBER 6, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,161

ORANGE TREE

Andrew Thoro, 5864 SW. 76th St., Miami, Fla. 33143

Filed Dec. 6, 1976, Ser. No. 722,591
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—45 1 Claim

1. A new and distinct variety of Temple orange tree, substantially as described, characterized particularly by the seedless quality of the fruit.

4,162

CHRYSANTHEMUM NAMED BRONZE DOLLY

Walter Grunwald, Westbury, N.Y., assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Feb. 14, 1977, Ser. No. 768,054
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—79 1 Claim

1. A new variety of chrysanthemum plant, substantially as herein shown and described, characterized by the medium bronze coloration of its flowers and their somewhat larger size as compared to the parent variety; and ability to be flowered the year around with a substantially uniform 9-week response.

PATENTS

GRANTED DECEMBER 6, 1977

ERRATA

For CLASS	See PATENT NO.
407–061	4,060,880
407–022	4,060,881
083–404.4	4,061,070
162–019	4,061,193
366–340	4,061,313
366–145	4,061,314
366–111	4,061,315
366–303	4,061,316
308–001 R	4,061,374
308–003.6	4,061,375
308–008.2	4,061,376
308–207 R	4,061,377
312–020	4,061,378
312–201	4,061,379
339–008 R	4,061,380
339–008 P	4,061,381
188–206 A	4,061,429
401–216	4,061,430
062–155	4,061,482
062–268	4,061,483
134–095	4,061,504
250–199	4,061,577
250–330	4,061,578
544–016	4,061,630
544–053	4,061,631
544–060	4,061,632
544–106	4,061,633
544–158	4,061,634
544–172	4,061,635
560–026	4,061,662
560–053	4,061,666
560–261	4,061,667
424–273 R	4,061,727
423–235	4,061,743
424–304	4,061,791
526–114	4,061,857
526–067	4,061,858
536–088	4,061,859
542–462	4,061,860
256–026	4,061,864
526–001	4,061,869
235–437	4,061,900
364–436	4,061,902
364–436	4,061,903
364–608	4,061,904
364–724	4,061,905

364–735	4,061,906
364–718	4,061,907
235–302.3	4,061,908
364–851	4,061,909
362–034	4,061,910
362–020	4,061,911
362–287	4,061,912
362–357	4,061,913
363–022	4,061,957
363–081	4,061,958
338–032 H	4,061,988
365–182	4,061,999
365–203	4,062,000
365–049	4,062,001
365–027	4,062,002
365–016	4,062,003
340–347 DA	4,062,013
340–347 DD	4,062,014

PATENTS

GRANTED DECEMBER 6, 1977

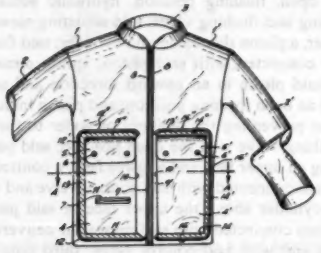
NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,060,852
STORM CUSHION
Dwight S. Meeks, 470 Fairview Road SW., Camden, Ark. 71701
Filed Jan. 20, 1976, Ser. No. 650,617
Int. Cl.[2] A41D *15/00*
U.S. Cl. 2—84 **8 Claims**

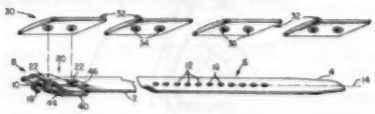
1. A storm cushion comprising:
a padded cushion having a top portion or cover and a bottom portion joined to said cover along a first edge of said cushion;
b. a one piece protective garment disposed inside said cushion between said cover and said bottom portion and attached to said bottom portion on all four sides of said bottom portion with said first edge attached to and coextensive with the rear bottom edge of said protective garment to form a padded seat for said protective garment; and
c. closure means carried by said cover and said bottom portion of said cushion to releasably secure said protective garment inside cushion.

4,060,853
GARMENT
Horacio Carlos Gabarro, 11 de Setiembre St., No. 285, Ramos Mejia, Buenos Aires, Argentina
Filed Sept. 2, 1976, Ser. No. 719,999
Claims priority, application Argentina, Sept. 5, 1975, 260282
Int. Cl.[2] A41D *1/04*
U.S. Cl. 2—108 **5 Claims**



1. A garment comprising:
a. a main body portion having separable edges that are openable along a vertical front center line;
b. two equal-sized, bellows pockets having approximately rectangular outlines and closeable top openings for access to the interiors of said pockets;
c. said pockets being permanently attached to the exterior of said body portion of said garment and arranged to be opposite each other on opposite sides of said front center line in regions adjacent said separable edges;
d. separable fastener means extending vertically along said front center line for openably closing said separable edges along the front of said garment in the region between said pockets;
e. detachable fastening means extending around three sides of each respective pocket to extend along the top edges of each pocket, along the lateral edges of each pocket remote from said front center line, and along the bottom edges of each pocket;
f. said pockets being sized and positioned so that the remainder of said garment other than said pockets can be folded to fit within said rectangular outline of said pockets and contained between said pockets when said pockets are arranged back to back;
g. said detachable fasteners extending around three sides of said pockets being connectable to each other to fasten said pockets to each other along three respective sides of said pockets to form a partially closed wallet containing said remainder of said garment; and
h. said separable fastener extending along the front center line of said garment being closeable to connect said separable edges of said garment to close said wallet by effecting a closure between the fourth sides of said pockets along said front center line.

4,060,854
BELT AND BUCKLE ASSEMBLY
Harvey William Friedman, Longmeadow, and Donald Wyman Corey, Wilbraham, both of Mass., assignors to Buxton, Incorporated, Agawam, Mass.
Continuation of Ser. No. 661,603, Feb. 26, 1976, abandoned.
This application Jan. 24, 1977, Ser. No. 762,198
Int. Cl.[2] A41F *3/02*
U.S. Cl. 2—338 **1 Claim**



1. Belt and buckle assembly comprising a belt member having means for interconnecting first and second ends thereof, a buckle member having first and second recesses therein, said belt member being further provided with first and second rivet means for engagement with said first and second recesses in said buckle member for receiving and releasably retaining said buckle member, said buckle member being distinct from said interconnecting means, said belt member second end being provided with a loop member mounted thereon and affording an opening for receiving said belt member first end, said loop member being held on said second end by way of a strap member affixed to said second end by said first rivet, said first rivet means further comprising means for retaining said interconnecting means on said second end of said belt member.

4,060,855

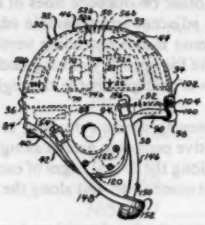
PAD FOR PROTECTIVE HELMET

Frederick A. Rappleyea, Park Ridge, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 584,088, June 5, 1975, Pat. No. 3,994,021. This application Sept. 1, 1976, Ser. No. 719,490

Int. Cl.[2] A42B 3/00

U.S. Cl. 2—413 7 Claims



1. Protective headgear, comprising:

a helmet;

pad means comprising, a resilient foam inner pad, a thin flexible front cover sheet of a foam material being formed into a configuration defining a cavity of a shape to closely receive and cover inner side surfaces of said inner pad, and a back cover sheet of flexible material covering a back surface of said inner pad and joined to said front cover sheet along bond lines adjacent a back portion of the inner pad and extending around sides of the inner pad; and

means for attaching the pad means to the helmet.

4,060,856

SURGICAL USE OF A LARYNGEAL PROSTHESIS

Nigel Edwards, Bristol, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 554,125, Feb. 28, 1975. This application Jan. 28, 1977, Ser. No. 763,697

Claims priority, application United Kingdom, Mar. 1, 1974, 9345/74

Int. Cl.[2] A61F 1/20

U.S. Cl. 3—1.3 2 Claims

1. The use of a laryngeal prosthesis for a laryngectomee, which prosthesis comprises a hollowed body having first and second tubes connected thereto, said body being apertured to provide a valve function allowing selective opening and closure of the hollow of said body relative to the exterior thereof, and which use comprises:

surgically forming in said laryngectomee a tracheostome sited in the midline region of the neck,

surgically forming in said laryngectomee a similarly sited fistula extending upwardly to a location adjacent the tongue base,

surgically forming a pseudo-glottis in the inner end portion of said fistula, and

respectively locating said tubes in said tracheostome and fistula with said body located outside the laryngectomy, said second tube being located only in the outer end portion of said fistula to avoid overlaying said pseudo-glottis, and said valve function serving to open said body to communicate said fistula with the external atmosphere for respiration and to close said body to communicate said tubes therethrough for phonation by activation of said pseudo-glottis.

4,060,857

WATER FLUSHING DEVICE

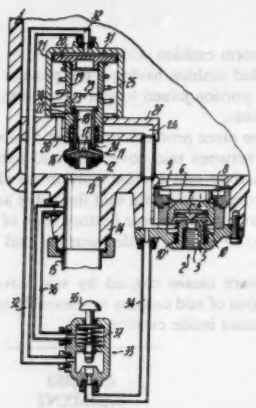
Lucien Couton, 49-51 rue de Soissons, Casablanca, Morocco

Filed Feb. 10, 1976, Ser. No. 656,976

Claims priority, application Switzerland, June 2, 1975, 7071/75

Int. Cl.[2] E03D 1/36, 3/10

U.S. Cl. 4—26 3 Claims



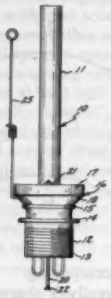
1. A water flushing device comprising: a fluid-tight tank; means for delivering water to the tank to trap and compress a quantity of air in the tank above the level of water; means defining a water-flushing outlet in the tank; a tank flushing valve movable between a closed position closing said outlet and an open, flushing position, hydraulic actuating means controlling said flushing valve, said actuating means including a cylinder, a piston slidable in said cylinder, said flushing valve slidably connected with said piston, spring means normally biasing said piston in an upward direction and said flushing valve to an open flushing position; and piston including a slide valve for preventing the delivery of water to the tank when said flushing valve is in the open position, said piston further including an upper face and a lower face, a control valve, first pipe means connected with said control valve and with the top of said cylinder above the upper face of said piston, second pipe means connected with said means for delivering water to the tank and with said control valve, third pipe means connected with said control valve and the atmosphere, whereby actuation of said control valve permits selective connection of the upper face of said piston to water pressure or to atmospheric pressure through said first and third pipe means respectively, causing said flushing valve to move between an open and closed position and causing said slide valve to turn on the water supply to the tank when the flushing valve closes and cut off the water supply to the tank when the flushing valve opens.

4,060,858

SELF-CENTERING TOILET VALVE

Emil L. Fabian, 553 W. 38th St., San Pedro, Calif. 90731

Filed Jan. 21, 1976, Ser. No. 651,066
Int. Cl.[2] E03D *1/34*
U.S. Cl. 4—57 R 7 Claims



1. A replacement valve assembly adapted for insertion into the seat of a flush outlet of a toilet holding tank, comprising:

a frusto-conical flexible valve seal conformed for receipt in said valve seat;

a buoyant disc attached to the upper surface of said valve seat;

a centering shaft concentrically attached to said disc and said seal to extend axially therefrom in a direction away from the lower surface of said seal; and

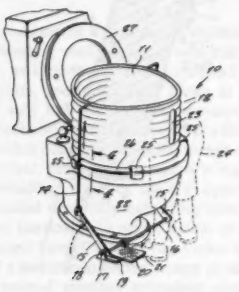
a centering yoke assembly supporting in contilener a coiled spring guide adaped to telescopically receive said centering shaft, a plurality of flexible fingers extending from the lower end of said guide, the free ends of said fingers extending beyond the dimensions of said outlet whereby an insertion of said fingers into said outlet maintains fingers in position.

4,060,859

MALE URINATING AID

Joseph B. Anderson, 19936 Moenart St., Detroit, Mich. 48212

Filed July 7, 1976, Ser. No. 703,186
Int. Cl.[2] E03D *13/00*
U.S. Cl. 4—102 2 Claims



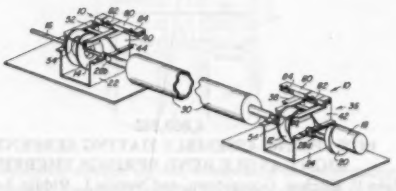
1. A male urinating aid for use with a toilet having a toilet bowl and a seat, comprising in combination, a cylindrical shield made of resilient material, said shield being made to incorporate accordion pleats so that said shield is readily collapsible by gravity to a collapsed inoperative position, means for mounting said shield inside the toilet bowl in said collapsed position beneath the toilet seat; and means for raising the shield from the collapsed inoperative position to a raised operative position above the toilet bowl said means for raising the shield including a circular stiff wire secured to the upper edge of said shield, the diametrically opposite sides of said circular wire being pivotally attached to the upper ends of a pair of downwardly extending links, lower ends of said links being pivotally attached to a pair of levers pivotable about a fulcrum means on a base plate, and said levers being integral with a foot pedal for being downwardly depressed to raise said shield to the raised operative position; and wherein the front end of said shield includes a vertical slit; and wherein said means for mounting the shield inside the toilet bowl includes a plurality of brackets mountable over an upper edge of the toilet bowl, said brackets supporting said shield when in a collapsed inoperative position.

4,060,860

BRAKING SYSTEM FOR MOTORIZED SWIMMING POOL COVERS

Joe H. Lamb, 3500 Hillside Lane, Salt Lake City, Utah 84109

Filed Mar. 31, 1976, Ser. No. 672,162
Int. Cl.[2] E04H *3/16, 3/18*
U.S. Cl. 4—172.14 3 Claims



1. In an improved swimming pool cover apparatus which includes a swimming pool cover having one of its ends fixed to a cover collection drum carried on a rotatable shaft to permit the swimming pool cover to be collection on said drum and released therefrom, draw cords connected to the non-fixed end of said swimming pool cover and extending out and back for connection to a pair of draw cord collecting reels carried on said shaft and positioned one on either side of said cover collection drum, means for selectively rotating said cover collecting drum and said draw cord collecting reels and thereby permit the swimming pool, said improvement comprising a pair of spaced apart arms pivotally mounted at one of its ends to a support member mounted in proximity of said draw cord collecting reels for movement in a plane horizontal thereto, opposing brake shoes mounted to said arms and a means for urging said brake shoes toward each other.

4,060,861

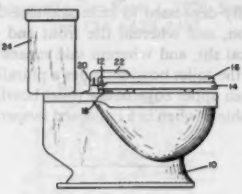
PROTECTIVE DEVICE FOR A TOILET LID

Dennis G. Lawrence, and Anne M. Lawrence, both of 92 Mount Vernon St., Fitchburg, Mass. 01420

Filed May 12, 1976, Ser. No. 685,814
Int. Cl.[2] A47K *13/00*
U.S. Cl. 4—253 3 Claims

1. In combination with a toilet including a bowl, a toilet seat, and a lid, a latch for the lid comprising a member including a foot member, a column thereon, and a relatively enlarged and elongated hold-down latching member, the foot member being receivable on the toilet bowl between the toilet bowl and the toilet seat, and the protective hold-down member overlying the lid of the toilet and extending generally radially with respect thereto, the foot and hold-down member being substantially rigid, wherein the column is in two telescoping parts, said parts comprising one part forming a part of the foot member

and the other part being a part of the hold-down member, means for adjusting the height of said column by adjusting the



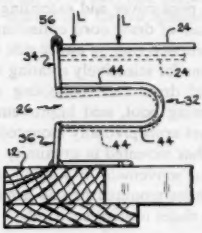
parts relatively to each other, and means to secure the parts in adjusted position.

4,060,862

BOX SPRING ASSEMBLY HAVING SERPENTINE RIGHT ANGLE BEND SPRINGS THEREIN

John P. Kitchen, Georgetown, and Neville L. Riddle, Lexington, both of Ky., assignors to Hoover Ball and Bearing Company, Saline, Mich.

Filed Apr. 28, 1976, Ser. No. 681,132
Int. Cl.[2] A47C *23/04*
U.S. Cl. 5—260 4 Claims



1. In a box spring assembly which includes a generally rectangular frame, a plurality of main wire springs arranged on said frame so that some of said springs are perpendicular relative to each other and others are parallel to each other, each of said springs having an elongated body portion which is a substantially straight length of wire arranged above said frame and downwardly extending end portions, each of which is of serpentine shape and has a pair of angularly related sections, one of each pair underlying and being positioned generally in the plane of an end section of said body portion and another one of each pair extending generally perpendicular to said body portion, said end sections being secured to said frame adjacent the periphery thereof and being capable of flexing movement toward said frame when loaded and away from said frame when unloaded, said one section of said end portion being in a substantially vertical plane and having generally horizontal parallel legs and a return bent-upon-itself connector extending therebetween, said legs being subjected to both bending and twisting stresses during said flexing movement.

4,060,863

CUSHIONS OR PILLOWS

Ashley Graham Craig, Wellington, New Zealand, assignor to Concraig Holdings Limited, London, England

Filed Nov. 8, 1976, Ser. No. 739,990
Int. Cl.[2] A47C *23/00, 13/00*
U.S. Cl. 5—337 12 Claims

1. A cushion or pillow comprising:

a flexible elongate generally V-shaped body having arms which are of equal length and which are connected together at one end to form an apex section, said apex section having an outer surface and an inner surface which is disposed between said arms;

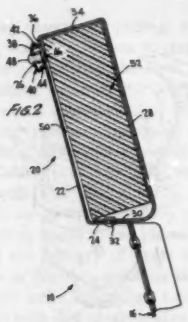
said apex section being concave in three intersecting planes which are at substantially right angles with each other so that said arms form an angle with each other and the thickness of said body adjacent said outer surface exceeds that thickness adjacent said inner surface, said body thereby presenting a surface which is substantially flat from top to bottom when said body is in a folded configuration with said arms substantially in contact with each other.

4,060,864

BOAT CONSTRUCTION INCORPORATING FLOTATION MEANS

Richard G. Woolworth, Lancaster, Pa., assignor to Woodstream Corporation, Lititz, Pa.

Filed May 3, 1976, Ser. No. 682,636
Int. Cl.[2] B63B *3/09, 3/28*
U.S. Cl. 9—6 M 8 Claims



8. A boat comprising a hull means including a bottom portion and upstanding wall portions, said hull means having an inner surface, an outer surface, longitudinally extending, laterally spaced sides, sponson means along at least a portion of each side of said hull means, said sponson means including upper and lower ends, inner and outer portions and defining an enclosed flotation chamber, flotation means carried within said flotation chamber, said sponson means being defined by a first upwardly extending member having upper and lower end portions, a second upwardly extending manner having upper

and lower end portions, the major extent of said second member being spaced laterally from the major extent of said first member, and a laterally directed flange at said upper end portion of said second member extending over said upper end portion of said first member, said upper end portion of said second member terminating in a second member lip means, and connecting means resiliently engaging said upper end portion of said first member with said second member lip means to secure said flotation means within said flotation chamber, one of the members of said sponson means being integral with said hull, securing means connecting said lower end portion of the other of said members to said hull means, and with laterally extending, longitudinally spaced, strengthening rib means spanning said bottom and upstanding wall portions of said hull means, said lower end portion of said other member extending between terminal portions of said strengthening rib means and the inner surface of said upstanding wall portions of said hull means, and said securing means simultaneously connecting said other members and said strengthening rib means to said upstanding wall portions of said hull means.

4,060,865

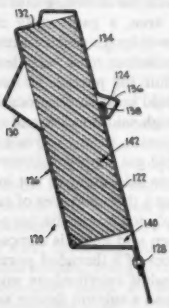
BOAT CONSTRUCTION INCORPORATING FLOTATION MEANS

Richard G. Woolworth, Lancaster, Pa., assignor to Woodstream Corporation, Lititz, Pa.

Continuation-in-part of Ser. No. 682,636, May 3, 1976. This application Aug. 27, 1976, Ser. No. 718,322

Int. Cl.[2] B63B *3/09*

U.S. Cl. 9—6 M **5 Claims**



1. A boat comprising a hull means including a bottom portion and upstanding wall portions, said hull means having an inner surface, an outer surface, longitudinally extending, laterally spaced sides, sponson means along at least a portion of each side of said hull means, said sponson means including upper and lower ends, inner and outer portions and defining an enclosed flotation chamber, flotation means carried within said flotation chamber, said sponson means being defined by a first upwardly extending member having upper and lower end portions, a second upwardly extending member having upper and lower end portions, the major extent of said second member being spaced laterally from the major extent of said first member, and a laterally directed flange at said upper end portion of said second member extending over said upper end portion of said first member, said upper end portion of said second member terminating in a second member lip means, and connecting means resiliently engaging said upper end portion of said first member with said second member lip means to secure said flotation means within said flotation chamber, said upper end portion of said first member terminating in a first member lip means including an outwardly and downwardly reverted first lip member, said second member including an inwardly and downwardly extending end portion terminating in an upwardly extending second lip member engaged under said first lip member, and said connecting means being defined by the resilience of said second member, said resilience being independent of the flotation means, and said resilience normally biasing said second lip member into securing engagement with said first lip member for maintaining said flotation means within said flotation chamber.

4,060,866

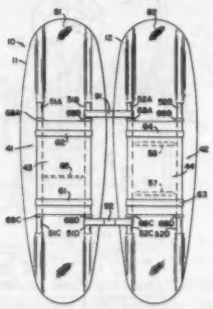
PNEUMATIC AQUATIC DEVICE

Walter L. Robinson, P.O. Box 642, Fort Bragg, N.C. 28302

Continuation-in-part of Ser. No. 461,637, April 17, 1974. This application Oct. 18, 1976, Ser. No. 733,531

Int. Cl.[2] A63C *15/02*

U.S. Cl. 9—310 D **12 Claims**



1. An inflatable aquatic device; comprising in combination:

plural aquatic members each having a plurality of flexible gas chamber means for containing a gas to provide buoyancy;

each of said plural aquatic members including a rigid frame having a plate region and a plurality of support means extending relative to said plate region;

means for securing said rigid frame to said flexible gas chamber means establishing plural substantially rigid aquatic members;

said means for securing said rigid frame to said flexible gas chamber means including a covering material adapted to substantially encompass said flexible gas chamber means;

said covering material having a plurality of covering formed apertures for receiving said plurality of support means extending relative to said plate means; and

connecting means for interconnecting said plural aquatic members to allow only limited relative movement therebetween.

4,060,867

INFLATABLE LIFE VEST

David D. Miller, Miami Springs, Fla., assignor to American Safety Equipment Corporation, Encino, Calif.

Continuation of Ser. No. 535,950, Dec. 23, 1974, abandoned. This application Aug. 23, 1976, Ser. No. 716,827

Int. Cl.[2] B63C *9/16*

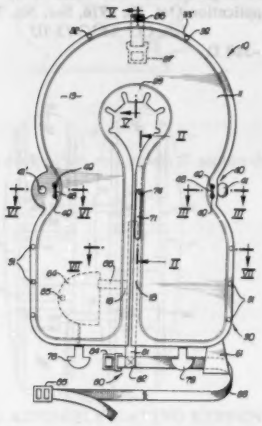
U.S. Cl. 9—313 **10 Claims**

1. In a life vest including buoyancy means to support the body of a person, gas supply means for supplying gas to the interior of the buoyancy means, the buoyancy means comprising front and rear tube means, each of the tube means having front and rear walls connected together along the marginal edges thereof in an airtight manner, the rear tube and the front tube being connected together, the buoyancy means having an inside marginal portion and an outside marginal portion, the improvement comprising:

the gas supply means comprising gas supply cartridge means for holding a given amount of gas under pressure and for releasing the gas into the tube means, the gas supply means

further comprising oral delivery means for supplying an additional amount of gas to the tube means.

temporary connecting means on the tube means sufficiently strong to remain connected after release of the gas from said supply cartridge means holding corresponding sections of the tube means together after the supply cartridge means has released its said given amount of gas into the tube means, the buoyancy means having a first volume when the temporary connecting means is holding the corresponding sections of the tube means together after



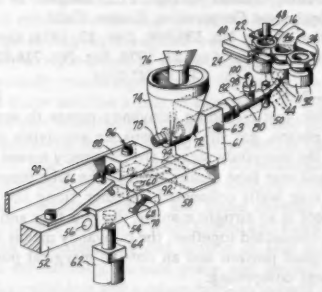
inflation by said given amount of gas from said gas supply cartridge means, the first volume of gas from the gas supply cartridge means providing sufficient buoyancy to support the body and filling said buoyancy means to less than the capacity it has after release of the temporary connecting means which releases the tube means, said tube means having a second volume greater than said first volume upon release of said temporary connecting means whereby additional gas may be supplied through the oral buoyancy means with a second volume to provide additional buoyancy to the body.

4,060,868

POWDER APPLYING APPARATUS AND PROCESS FOR MAKING SELF-LOCKING THREADED ELEMENTS

Maynard Arnold Axvig, Westminster, and Jose Asuncion Franco, Los Angeles, both of Calif., assignors to USM Corporation, Boston, Mass.

Filed Jan. 17, 1977, Ser. No. 760,137
Int. Cl.[2] B23G *9/00*; B05B *1/00, 7/14*
U.S. Cl. 10—72 R **9 Claims**



1. In an apparatus for applying locking patches of resilient heat softenable resin to internally threaded articles having openings at both ends comprising:

a support for conveying at a uniform continuous speed for treatment a uniform succession of said threaded articles with the openings at the ends of said articles substantially uncovered,

means for heating said threaded portions of said articles to a temperature above the softening point of said resin,

means for providing a stream of fine particles of said resin entrained in a gaseous jet,

means including a guide for directing said stream of resin particles through the opening at a first end of one of said articles against an area of the threaded portion of said one article during movement in said path to cause said resin particles to be softened by heat from said threaded portion and to adhere to said area, and

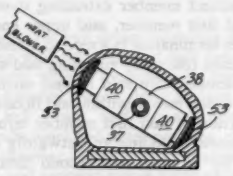
vacuum exhaust means adjacent the opening at the other end of said article on said support in operative relation to draw air through said threaded portions to reduce deposition of resin particles in undesired areas of said articles and to draw off resin particles which have passed through said threaded portions, the improvement which comprises control means responsive to movement of a repeating feature in the articles of said succession past a reference location to activate said means providing a stream of resin particles when said guide is in said stream-directing relationship to a threaded area and to deactivate said means for providing a stream of resin particles when said guide is not in said stream-directing relationship, said means for providing a stream of particles entrained in a gaseous jet comprising a conduit terminating in a discharge orifice from said guide for directing said stream of resin particles against said area, a gas supply connected to deliver a stream of gas through said conduit and out through said orifice, a continuous resin particle supply, and an opening in said conduit for passage of resin particles from said supply into said conduit at a location to be entrained and carried through said conduit and out through said orifice by said gas stream, means activated by said control means to shut off said gas supply to interrupt said stream of resin particles when said guide is not in position to direct said stream against a threaded area of said article and to restore said gas supply to resume discharge of said stream of resin particles when said guide is disposed to direct said stream against an area of a threaded portion of an article, a port into said conduit intermediate said conduit opening and said orifice and a suction device associated with said port to reduce pressure in said conduit to continuously pull air through said conduit opening and said orifice and to draw off through said port resin particles left in or deposited in said conduit when said gas supply is shut off.

4,060,869

APPARATUS FOR FORM FITTING SHOES AND BOOTS

Dennis N. Brown, 8528 Custer School Road, Custer, Wash. 98240

Continuation-in-part of Ser. No. 560,740, March 21, 1975. This application June 9, 1976, Ser. No. 694,366
Int. Cl.[2] A43D *5/00*
U.S. Cl. 12—115.2 **5 Claims**



1. An apparatus for internally expanding foot gear compris-

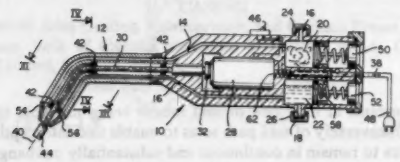
ing a fluid pressure cylinder, at least one fluid pressure actuated piston mounted in said cylinder for reciprocation therein, a domed member detachably mounted on said piston for engagement with the inner surface of the foot gear to apply pressure thereto, a second dome member and means on said cylinder for supporting said second dome member for engagement with said foot gear oppositely of said first named dome member.

4,060,870

TOOTHPASTE ADMINISTERING AUTOMATIC TOOTHBRUSH

Anthony Cannarella, 221 Dorothy Drive, N. Haledon, N.J. 07508

Filed Dec. 23, 1975, Ser. No. 643,783
Int. Cl.[2] A46B *13/04*
U.S. Cl. 15—24 **9 Claims**



1. A dental appliance comprising:
- a housing including a curved tubular extension, said housing having opposite ends and formed with first and second elongated recesses;
- first and second pump means secured to said housing for pumping a paste and fluid directly through said first and second recesses, respectively, for the fluid to emerge from said second recess near said other of said ends;
- electric rotary drive means disposed in said housing between said opposite ends and having a first longitudinal axis;
- a flexible drive shaft having a second longitudinal axis and first and second ends rotatably disposed within said curved tubular extension, said first end of said drive shaft being operatively connected to said drive means and said second end of said shaft extending through the other of said housing ends, said housing being divided into first and second portions separable along a plane substantially intersecting said longitudinal axes;
- bearing means for rotatably supporting said flexible shaft extending therethrough and for securing the first and second portions of said tubular extension together;
- a toothbrush drivably attached to said second end of said flexible shaft to rotate therewith;
- valve means to close off said first and second elongated recesses, respectively, near said other of said ends of said housing; and
- switch means attached to said housing and connected to said electric rotary drive means and to a power supply for switching said electric rotary drive means on and off, whereby upon actuation of said pump means the paste and the fluid are applied to an oral cavity containing teeth and the teeth therein are cleanable by said toothbrush upon actuation of said switch means, and direct application of the toothpaste and the fluid.

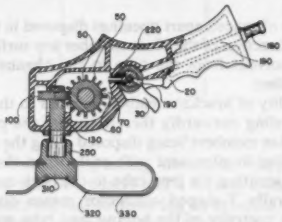
4,060,871

WATER-POWERED DISH SCRUBBER

John B. Bryerton, Lock Haven, Pa., assignor to Raymond Lee Organization Inc., a part interest

Filed Sept. 10, 1976, Ser. No. 722,278
Int. Cl.[2] A46B *13/06*
U.S. Cl. 15—29 **3 Claims**

1. A water powered scrubber for use in dishwashing operations and connectable to a source of water under pressure, said scrubber comprising:
- a hollow housing having drain holes in the bottom thereof;
- a hollow flexible hose attached at one end to the housing and detachably secured at the other end to said source;
- trigger operated valve means located in the housing and connected in series with the hose, said means including a nozzle, said means when the trigger is pulled allowing water to flow through the hose into the nozzle, said water being expelled from the nozzle as a jet, said means when the trigger is not pulled blocking the flow of water;
- a first vertical shaft having an upper end in the housing and a lower end projecting downwardly out of the housing; said lower end being cubically shaped;
- a brush like attachment disposed outside of the housing



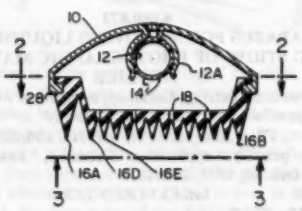
below the first shaft, said attachment having two opposed flexible lips detachably engaging the cubically shaped lower end of the first shaft;
- a horizontal gear in the housing secured to the upper end of the first shaft;
- a vertical paddle wheel in the housing disposed in the path of the jet, said jet impinging upon the wheel to cause same to rotate about its center in a vertical plane, the water thereafter draining downward through said holes;
- a second horizontal shaft in the housing disposed at right angles to the wheel, said wheel being secured at its center to one end of the second shaft; and
- a horizontal worm at the other end of the second shaft and engaging said gear whereby rotation of the wheel causes rotation of the second shaft, worm, gear, first shaft and attachment.

4,060,872

WINDSHIELD WIPER AND WASHER

Hans H. Bucklitzsch, Rte. 2, Bloomington, Ill. 61701

Filed Feb. 5, 1976, Ser. No. 655,521
Int. Cl.[2] B60S *1/46*
U.S. Cl. 15—250.04 **2 Claims**



1. A windshield wiper and washer device comprising, in combination:
- a rigid longitudinally elongated back member having a generally U-shaped transverse cross-section defining a leading edge, a trailing edge, and opposed opposite end wall members;
- a flexible longitudinally elongated wiper blade having a

substantially flat top surface, a sloping front surface, a sloping back surface, and a pair of opposed end surfaces;

the wiper blade removably affixed to the back member between the leading and trailing edges thereof and extending completely between the opposite end wall members thereof so as to define therewith a confined passageway between the back member and the top surface of the wiper blade;

a plurality of spaced apart channels each extending completely through the wiper blade from the top surface thereof to the outer front surface thereof;

said channels each having a front discharge opening formed along the blade front surface at each channel outer end;

a hollow solvent feed tube disposed in the confined passageway along the back member and extending longitudinally therealong centrally thereof and terminating adjacent and inwardly from the back member opposite end wall members;

a series of spaced apart openings disposed in the feed tube in the direction of the blade member top surface for dispensing solvent from the tube to the channels in the blade member;

a plurality of bracket members secured to the back member extending outwardly therefrom into the passageway, the bracket members being disposed along the axis of the back member in alignment with each other, the bracket members securing the feed tube to the back member;

a generally T-shaped connector means disposed substantially centrally of the hollow feed tube and in fluid communication therewith, the arms of the T being connected to the feed tube with the body of the T projecting outwardly of the back member in a direction opposite from the position of the blade member;

a flexible hinge defining element of a hollow tubular construction having one end affixed to the projecting portion of the T-shaped connector means for delivering solvent thereto;

a hollow tubular shaped linkage arm member having one end affixed to the free end of the flexible hinge element for the purpose of moving the back member and wiper blade back and forth across a windshield, the linkage being hollow and in fluid communication with the flexible hinge to pass solvent under pressure therethrough;

a plurality of spray heads associated with some of the openings of the feed tube;

the wiper blade comprising two end blades and a plurality of smaller blade elements disposed therebetween and extending longitudinally parallel thereto; and

whereby solvent can be supplied through the linkage arm member, through the hinge member, through the connector, through the feed tube, through the channels, and out of the channels front discharge openings onto the windshield to form an even coating of dispensed solvent in the path of the wiper blade for cleaning the windshield.

4,060,873

APPARATUS FOR REMOVING LIQUIDS FROM MOVING STRIPS OF PHOTOGRAPHIC MATERIAL OR THE LIKE

Jürgen Leuchter, Tutzing, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

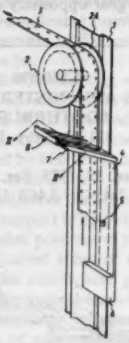
Filed June 15, 1976, Ser. No. 696,200

Claims priority, application Germany, June 20, 1975, 2527560; Oct. 10, 1975, 2545487

Int. Cl.[2] G03D *5/00*

U.S. Cl. 15—256.5 **21 Claims**

1. In a machine wherein elongated strips are moved seriatim lengthwise through a succession of liquid baths and wherein at least some of the strips exhibit the tendency to move sideways, particularly in a developing machine for strips of photographic material, a combination comprising a liquid-containing receptacle; devices for guiding a moving strip along a predetermined path extending through and beyond said receptacle so that the moving strip contacts the liquid in said receptacle and successive increments thereof entrain some of the liquid on leaving the contents of said receptacle; and apparatus for removing at least some entrained liquid from such increments; including wiper means having two liquid intercepting members each in contact with a different side of each increment which emerges from the liquid in said receptacle, and support means for said



wiper means, at least one of said means being movable in a plane transversely of said path so as to enable said intercepting members to remain in continuous and substantially unchanged liquid-intercepting contact with the respective sides of the moving strip irrespective of eventual sidewise movement of said increments in the region of said wiper means.

4,060,874

APPARATUS FOR REMOVING DUST HAVING DEVICE FOR PRODUCING AIR CURTAIN

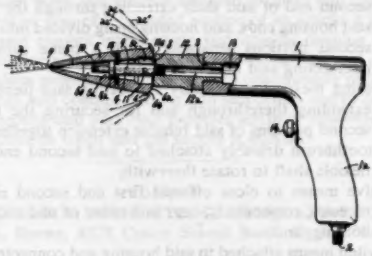
Yasuzi Furutsutsumi, 1-19, 2-chome, Midoridai, Kawanishi, Hyougo, Japan

Filed Feb. 17, 1976, Ser. No. 658,668

Claims priority, application Japan, Feb. 21, 1975, 50-24987[U]; Apr. 15, 1975, 50-50759[U]

Int. Cl.[2] A47L *5/14*

U.S. Cl. 15—405 **5 Claims**



1. An apparatus for pneumatically removing dust, comprising:

a hollow cylindrical main body and integral handle portion having an inlet for receiving high pressure air from a source of high pressure air, the main body having an outlet for the high pressure air at the front end thereof;

a hollow nozzle element secured to the outlet of the main body for receiving high pressure air therefrom and having

a hollow conical nozzle cap fitted around the nozzle element and secured thereto, the nozzle cap having an air discharge opening in its front end in communication with said front orifice in said nozzle element and having an annular surface at the rear end thereof having an inner portion which is perpendicualr to the longitudinal axis of said nozzle cap, and at least two contiguous frusto-conical

outer portions angling at successively greater angles toward the front of said nozzle cap, the front end of said main body having a surface thereupon parallel to said perpendicular portion of said annular surface to define a small clearance therebetween and extending radially outwardly of said longitudinal axis a distance which is between the inner and outer radial dimensions of the innermost frusto-conical portions of said annular surface, the inner end of said clearance being in communication with said rear orifice,

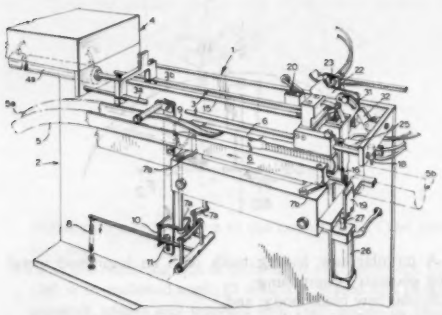
whereby high pressure air is forced out of said air discharge opening in said nozzle cap to form a jet of high pressure air and when the high pressure air is simultaneously forced out through said clearance it forms a conical air curtain spreading forwardly from the forward edge of the outermost frusto-conical portion.

4,060,875

APPARATUS FOR CUTTING STUFFED SAUSAGE CASING

Lincoln John Gosling, Peterborough, and Graham Fraser, Lindsay, both of Canada, assignors to Union Carbide Canada Limited, Toronto, Canada

Filed July 8, 1976, Ser. No. 703,495
Int. Cl.² A22C *11/00*
U.S. Cl. 17—1 F **4 Claims**



1. An apparatus for cutting linked stuffed sausage casing into individual lengths in the area of a linkage, which apparatus comprises:

a. a passage for guiding a chilled casing to a cutting zone in said apparatus, said chilled casing being stuffed with sausage meat and linked at predetermined points along its length to define individual sausage lengths therebetween;

b. a rail guide positioned above said passage and lateral herewith;

c. a carriage assembly mounted on said rail guide and slidably moveable thereon along the direction of said passage, said carriage assembly including a forked blade tangentially pivoted thereon with respect to said passage;

d. means for advancing said carriage assembly along said rail guide towards said cutting zone, said forked blade being positioned in the path of said chilled casing when said blade is pivoted in the fully downward position whereby said forked blade may be wedged over a linkage on said chilled casing and pull said casing towards said cutting zone when said carriage assembly advances towards said cutting zone;

e. means for withdrawing said carriage assembly from said cutting zone, said forked blade being pivoted forward and upward out of the way of said casing when said carriage assembly is so withdrawn;

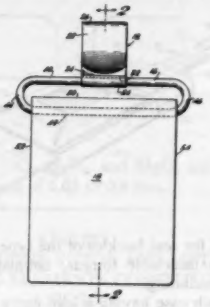
f. a cutting blade in said cutting zone and means for raising said cutting blade to cooperate with said forked blade when said carriage assembly is in said cutting zone to thereby cut said chilled casingin the area of said linkage.

4,060,876

WALLET SUPPORTING CLIP

Diogenes De Soto, 2831 Florida Ave., Miami, Fla. 33133

Filed July 14, 1976, Ser. No. 704,995
Int. Cl.² A44B *21/00*
U.S. Cl. 24—3 J **2 Claims**



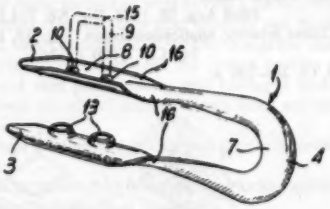
1. A foldable wallet suspending device for supporting a wallet between a pair of trousers and a wearer comprising a clip having an inner leg and an outer leg on opposite sides of a hairpin turn, the inner opposed surfaces of said inner and outer legs defining belt-engaging means with the outer or opposite side of said inner leg defining a body-engaging surface, each of said legs having a terminal end zone, and an elongated link fixed on the upper portion thereof to the terminal zone of said inner leg with the lower portion thereof defining a foldable wallet-receiving support bar.

4,060,877

FASTENER FOR CONVEYOR BELTS OR BANDS

Jean-François Schick, Paris, France, assignor to Societe Goro, Chelles, France

Filed Feb. 23, 1977, Ser. No. 771,254
Claims priority, application France, Feb. 27, 1976, 76.05482
Int. Cl.² F16G *3/02*
U.S. Cl. 24—33 B **4 Claims**



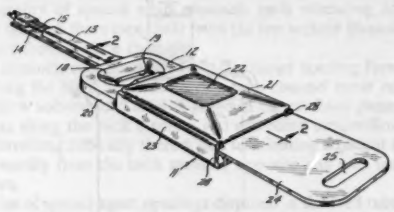
1. A belt-fastener of the type consisting of a metallic element bent in a U-shaped elbow and comprising two superposed arms forming clamping tongues for fastening said element on said belt and an elbowed portion constituting a hinge-knuckle adapted to receive a hinge-pin, wherein said belt-fastener is manufactured from sheet metal strip of substantially constant width and the elbowed portion is folded in two in the transverse direction, the two sides of the fold thus formed being applied against each other in a plane located substantially at right angles to the general plane of the two clamping tongues and thus ensuring a substantial increase in the mechanical strength of the hinge-knuckle while freeing the space required for the engagement of the hinge-knuckles of the fasteners which are placed on the other end of the belt or band, the two sides thus folded-back being progressively joined to each edge of said clamping tongues.

4,060,878

BUCKLE SWITCH

Joseph J. Dyki, Romeo, Mich., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 20, 1975, Ser. No. 623,665
Int. Cl.[2] H01H *3/16;* A44B *11/25*
U.S. Cl. 24—230 A **2 Claims**



1. A switch for seat buckles of the type including a channel frame and an insertable tongue, latched upon closure, the combination including:

a resin switch case having a lead entry portion, a lead support portion, lead contactor support portion, and an actuator support portion;

a pair of electrical leads supported in said entry portion of said encasement and extending through said lead support portion and to said lead contactor support portion;

a pair of flat spring resilient lead contactors electrically connected to said leads and extending into said actuator support portion of said encasement;

a non-conducting actuator in said actuator support portion of said encasement and journalled in said encasement, one profile of said actuator extending above said actuator support portion in an interference path with said tongue and another profile of said actuator resiliently supported by said lead contactors; and

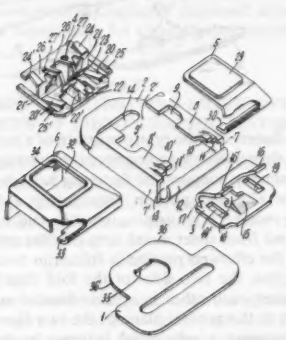
a contactor bar through said actuator eccentric to the pivot axis of said actuator and movable with said actuator in a path selectively intersecting and wiping said lead contactors with said bar.

4,060,879

SEAT BELT BUCKLE

Juichiro Takada, Tokyo, Japan, assignor to Takata Kojyo Co., Ltd, Tokyo, Japan

Filed Aug. 16, 1976, Ser. No. 714,544
Claims priority, application Japan, Aug. 19, 1975, 50-99817
Int. Cl.[2] A44B *11/26*
U.S. Cl. 24—230 A **9 Claims**



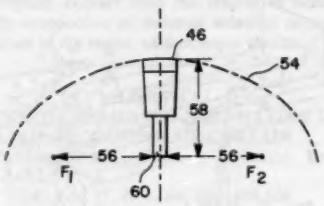
1. A coupling device comprising a buckle including a hollow body member having a front opening and including longitudinally extending side walls provided with upper inwardly directed fulcrum sections, a coupling tongue longitudinally slidable through said front opening and having a first latching shoulder, a latching member housed in said body member and including upper and lower arm portions diverging forwardly from a knee portion engaging said fulcrum sections whereby said latch member is swingable between raised lock and depressed unlock positions, said latching member lower portion having a second shoulder movable with the swinging of said latch member between a lock position with said second shoulder engaging said first shoulder of the inserted tongue to releasably prevent the withdrawal thereof and an unlock position with said first and second shoulders out of registry and a unitary spring member disposed in said body member and including first spring elements resiliently urging said latching member to swing toward a predetermined lock position and a secnd spring element normally bearing on said tongue member when in fully inserted position to resiliently urge said tongue member toward a retracted position relative to said body member.

4,060,880

CIRCULAR SAW HAVING AN IMPROVED TOOTH GEOMETRY AND METHOD OF MAKING THE SAME

Robert H. Nowak, Mentor, Ohio, assignor to The Motch and Merryweather Machinery Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 587,504, June 16, 1975, Pat. No. 4,012,820. This application June 17, 1976, Ser. No. 697,288
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—61 **6 Claims**



1. A circular saw having teeth with an improved metal cutting geometry comprising:

a circular saw blade body; and,

a plurality of saw teeth means attached to said saw blade body and separated one from another by gullet means, said saw teeth means including a plurality of higher and lower teeth arranged in a triple-chip like manner, said teeth means including at least a leading face and a first and a second side face, said saw teeth means further including a continuously curved cutting surface located on the upper portion of said leading face of said saw teeth means, said continuously curved cutting surface having two edge portions where said continuously curved cutting surface meets said first and second side faces and a central portion intermediate said two edge portions and advanced forward of said two edge portions, said cutting surface having a substantially eliptical cross-section.

4,060,881

CUTTER HEAD ASSEMBLY FOR GEAR CUTTING MACHINES

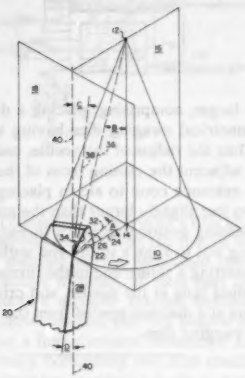
Arthur B. Ryan, Canandaigua, and Charles B. Thomas, Rochester, both of N.Y., assignors to The Gleason Works, Rochester, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,837
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—22 **7 Claims**

1. In a cutter head assembly of a type which can carry of plurality of cutting blades projecting from a front face thereof for engaging and cutting a workpiece to form gear tooth slots in the workpiece, said cutting head assembly including (a) a main body member having blade-receiving slots formed radially into the outer circumference thereof and at an inclination

to its center axis of rotation, and (b) a ring member for enclosing said circumference of the main body member and for securing said cutting blades therein, an improvement in said cutter head assembly for making it more universal in its acceptance of different types of cutting blades having cutting face portions which do not require resharpening, said improvement comprising a relationship of each blade-receiving slot to a plane of rotation (10) located at a front face of the cutter head, a reference plane (16) which is perpendicular to the plane of rotation (10) and positioned to pass through a center axis of rotation of the cutter head, and another reference plane (18) which is positioned at right angles to both of the planes (10) and (16) such that

each blade-receiving slot has a front edge (22) which is positioned on or adjacent to a radius taken from the center axis of said main body member in said plane of rotation (10), so that a single blade carried within each slot can be



radially adjusted relative to the center axis of the assembly, and

each blade-receiving slot is inclined to said reference plane (16) at an included angle D which is related to a range of pressure angles and possible side rake angles of cutting blades which can be mounted in said slot, so as to avoid a negative hook angle position for any blade carried within a given slot, wherein said angle *D* is determined by a projection of a cutting edge (34) of such a cutting blade onto said reference plane (16), and said hook angle is determined by a projection of the cutting edge (34) onto the reference plane (18), and including

a plurality of cutting blades for use in the cutter head assembly, each of the cutting blades having a cutting face portion which is an extension of a shank portion thereof and which does not require resharpening when the cutting blade is resharpened.

4,060,882

CYLINDERS AND ROLLERS FOR PRINTING MACHINES

Frantisek Pospisil, Brno, and Vaclav Sedlak, Jedovnice, both of Czechoslovakia, assignors to Adamovske strojirny, narodni podnik, Adamov, Czechoslovakia

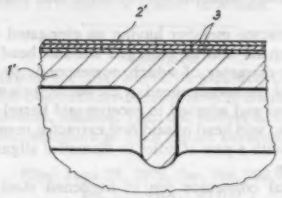
Filed Jan. 27, 1976, Ser. No. 652,778

Claims priority, application Czechoslovakia, Jan. 27, 1975, 515/75; Jan. 27, 1975, 512/75; Jan. 27, 1975, 513/75

Int. Cl.² B21B *31/08*

U.S. Cl. 29—132 **3 Claims**

1. A cylinder roller for printing machines, comprising a cylinder body made of a corrodible ferrous metal, and at least one inseparable non-corrodible cylindrical surface layer on the body of said cylinder or roller, said layer consisting in combination of at least two metal oxides selected from the group



consisting of Al_2O_3, TiO_2, CrO_3, and MgO, said inseparable layer having a thickness of 0.05 to 0.6 mm.

4,060,883

COMPOUND TURBINE ROTOR AND METHOD FOR MANUFACTURING ELEMENTS CONSTITUTING SUCH A ROTOR

André Coulon, and René Perrin, both of Belfort, France, assignors to Societe General de Constructions Electriques et Macaniques Alsthom, Paris Cedex, France

Division of Ser. No. 569,435, April 18, 1975, Pat. No. 3,967,919. This application Apr. 14, 1976, Ser. No. 676,787

Claims priority, application France, May 21, 1974, 74.17627

Int. Cl.² B23P *15/04*

U.S. Cl. 29—156.8 R **2 Claims**

1. A method for manufacturing a turbine rotor comprising the steps of:

forging blade bearing blocks made of a steel comprising carbon and nickel;

joining at least one axial protuberance to each block by casting a transition zone between the axial protuberance and the block from a consumable electrode with said protuberance being formed of steel having a carbon content and a nickel content lower than those of said block, and wherein said consumable electrode comprises steel having a carbon content between the carbon content of said block and said protuberance and having a nickel content between the nickel content of said block and said protuberance;

reforging and heat treating said blocks with their axial protuberances; and

welding of axial protuberances of respective blocks together to form an axial succession of blocks.

4,060,884

EXTRACTOR FOR REMOVING DAMAGED BARREL LOCK FROM LOCKING RING OF A KILOWATT-HOUR METER

Earle B. Hamilton, 1423 Breton Hill Drive, Hartsville, Pa. 18974

Filed July 9, 1976, Ser. No. 703,941

Int. Cl.² B23P *19/04*

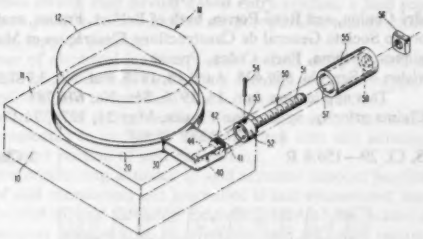
U.S. Cl. 29—256 **1 Claim**

1. An extractor tool for a hardened steel barrel lock having a hollow barrel, ball detents projecting radially outwardly from said barrel, means within said barrel retaining said ball detents in radially outward position, an enlarged annular head at the outward end of said barrel, and a pair of small aligned diametral holes in said heat for receiving a seal-wire, said holes

having a diameter not greater than one-tenth inch, said barrel lock being within a cover housing, said head projecting slightly therefrom to expose said seal-wire holes, said seal-wire holes being closely adjacent said housing, said extractor tool comprising:

a. a first extractor member having an elongated externally threaded shank and an enlarged annular head having a recess the diameter of which corresponds to the outer diameter of the annular head of the barrel lock which is to be extracted and adapted to receive said barrel lock head in its recess, said head of said first extractor member being provided with a pair of holes in diametral alignment with each other;

b. an integral connector pin of hardened steel having a length corresponding to the outer diameter of the enlarged head of said first extractor member and of sufficiently small diameter to be received in the small aligned holes in the head of said barrel lock, said pin inserted into the pair of aligned holes in the head of said first extractor member and into the small aligned holes in the head of said barrel lock when said head of said barrel lock is received



within the recess in the head of said first extractor member, whereby said pin connects said first extractor member to said barrel lock head;

c. a hollow cylindrical extractor sleeve having a cylindrical bore the diameter of which corresponds to the outside diameter of the annular head of said first extractor member and adapted to receive said head, said sleeve having at its outward end an axial opening through which the outward end of the threaded shank of the first extractor member is adapted to project when said sleeve is placed over the head of said first extractor member and receives said head in its recess;

d. a nut adapted to be received on the projecting portion of said threaded shank, whereby tightening of said nut on said shank against said sleeve when the forward end of said sleeve is in abutment against the housing of said barrel lock is effective to exert a pulling force on said shank thereby to exert on said barrel lock on both sides of the center axis thereof outward pulling forces which are parallel to the center axis of said barrel lock and of substantially equal magnitude.

4,060,885

METHOD OF MAKING A NEEDLED SUTURE

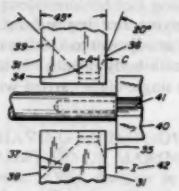
John Ronald Hoffman, New Milford, and Peter John Marsland, Monroe, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 691,102, May 28, 1976. This application Dec. 16, 1976, Ser. No. 751,769

Int. Cl.² B21D *39/00*; B23P *11/00*

U.S. Cl. 29—407 **2 Claims**

1. A method of making a needled-suture comprising a surgical needle having a pointed end and a blunt end, having a coaxial cylindrical blind hole in the blunt end; a suture fitted into said blind hole; and a crimp in said blunt end, retaining the suture in said hole, said crimp being spaced from the blunt end of the needle sufficiently far that the suture emerges from an essentially undistorted portion of the blind hole, said crimp leaving the front end of the blind hole essentially undistorted, so that at least about 0.010 inches of the front end of the suture is essentially undistorted; and crimp being elliptical and bringing the minor diameter of the ellipse formed in the blind hole in contact with the suture in compressing frictional relationship so that the pull-out value for the average pull-out plus 2 sigma deviation is less than (1) about 3 pounds for size 1 and 0, about 2.5 pounds for sizes 2/0 and 3/0 and about 1.5 pounds for size 4.0 and smaller or (2) half the tensile strength of the suture, whichever is smaller; and the pull-out has a minimum of at least 0.4 pounds for size 3/0 and larger, 0.25 pounds for size 4/0, and 0.1 the tensile strength of the suture for sizes 5/0 and smaller



whichever is larger, comprising: placing a drilled end needle between symmetrical swaging dies having a swaging radius slightly less than the radius of the needle, and an enlargement of the radius adjacent the closing faces of the dies, and which dies have an entrance cone to aid in placing the needle, and which open to just slightly larger than the needle, holding the needle in threading position against a threading block, which has a threading slot to align a suture end with the blind hole in the needle, inserting a suture end in the threading slot and into the aligned blind hole in the needle, and crimping the needle onto the suture at a distance spaced from the blunt end thereof between the swaging dies.

4,060,886

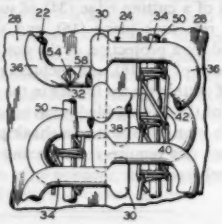
METHOD AND APPARATUS FOR MANUFACTURE OF SLIDE FASTENER STRINGER

George B. Moertel, Crawford, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 539,643, Jan. 9, 1975, Pat. No. 3,975,801. This application June 14, 1976, Ser. No. 696,098

Int. Cl.² B29D *5/00*

U.S. Cl. 29—410 **9 Claims**



1. A method of forming a stringer for a slide fastener comprising the steps of

forming a continuous filament into a coupling element having successive sections each including a head portion, a pair of leg portions extending from opposite sides of the head portion, and a connecting portion interconnecting to a leg portion of an adjoining section;

deforming an inside surface of one leg portion of each section to form an interlocking means;

engaging an elongated member with the one leg portion at the interlocking means of each section;

biasing the elongated member against the one leg portion of each section such that the elongated member is inter-

locked with the interlocking means of each one leg portion to prevent longitudinal and transverse movement of the elongated member relative to the one leg portion; and

securing each section of the coupling element to a tape;

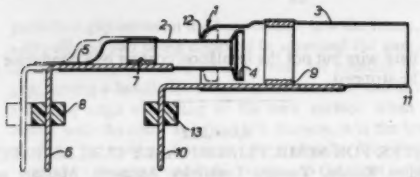
said deforming step forming a sharp edge on the one leg portion to grip the elongated member.

4,060,887

MULTIPLE CONDUCTOR CONNECTOR AND METHOD OF CONNECTING CONDUCTORS TO TERMINALS THEREWITH

Pierre De Groef, Brussels, Belgium, assignor to N. V. Raychem S.A., Belgium

Filed May 27, 1975, Ser. No. 580,940
Int. Cl.² H05K *3/34, 1/04;* H01R *17/18, 43/02*
U.S. Cl. 29—626 **31 Claims**



1. An electrical connector comprising a first hollow member having first and second ends at least the first of which is open, said first hollow member having associated therewith a first electrically conductive member, at least part of which first electrically conductive member extends beyond the second end of the first hollow member, said first hollow member being adapted to receive a first electrical conductor and providing means for electrically connecting said first conductor to said first conductive member, a second hollow member having associated therewith a second electrically conductive member, at least part which second electrically conductive member extends beyond one of the ends of the second hollow member, said second hollow member being adapted to receive a second electrical conductor and providing means for electrically connecting said second conductor to said second conductive member, the first end of the first hollow member being slidably and adjustably retained in the second hollow member, and the two electrically conductive members being electrically insulated from each other.

26. A method for electrically connecting each of first and second electrical conductors to a different terminal in an electrical component having at least two spaced terminals comprising:

a. inserting said first conductor into the first end of a first hollow member having first and second ends at least the first of which is open, said first hollow member having associated therewith a first electrically conductive member, at least part of which first electrically conductive member extends beyond the second end of the first hollow member, said first hollow member providing means for electrically connecting said first conductor to said first conductive member;

b. inserting said second conductor into the first end of a second hollow member having associated therewith a second electrically conductive member, at least part of which second electrically conductive member extends beyond one of the ends of the second hollow member, said second hollow member providing means for electrically connecting said second conductor to said second conductive member, said second hollow member having the first end of the first hollow member slidably retained therein;

c. slidably adjusting the first and second hollow members to position said first and second conductive members for connection to separate spaced terminals;

d. electrically connecting said first conductor to said first conductive member and said second conductor to said second conductive member; and

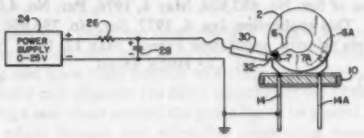
e. electrically connecting said first and second conductive members to respective spaced terminals.

4,060,888

METHOD OF IMPROVING OHMIC CONTACT THROUGH HIGH-RESISTANCE OXIDE FILM

Virgil E. Bottom, Abilene, Tex., and Robert E. Christian, Shawnee, Kans., assignors to Tyco Filters Division, Inc., Phoenix, Ariz.

Filed June 29, 1976, Ser. No. 700,756
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **5 Claims**



1. A method of making improved ohmic contact between at least one aluminum contact of a quartz crystal resonator and an electrically-conductive material comprising the steps of:

forming an aluminum oxide coating on said aluminum contact;

coupling a wire lead to said contact with said electrically-conductive material; and

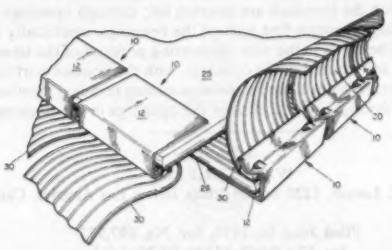
discharging a current pulse of a predetermined magnitude and duration through said electrically-conductive material and said aluminum oxide coating so as to form a low electrical resistance ohmic path between said aluminum contact and said electrically-conductive material.

4,060,889

METHOD OF FORMING FLEXIBLE ELECTRICAL CIRCUIT CONNECTIONS

Eugene J. Zielinski, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 669,950, March 24, 1976, Pat. No. 4,019,798. This application Nov. 12, 1976, Ser. No. 741,180
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **3 Claims**



1. A method for attaching and holding flexible circuit members having multiple conductors terminating in pads to conductive mounting pad terminals of an electrical component which comprises the steps of:

aligning the mounting pad terminals of said electrical component with said flexible circuit pads;

adhesively adhering said mounting pad terminals to said flexible circuit pads;

attaching force distribution members to the upper surface of said adhered flexible circuit;

opening clip members which are dimensioned to fit over said

flexible circuits, force distribution means and electrical component when opened;

inserting said open clip members over said force distribution members and over said mounting pad terminals with substantially zero force applied to said flexible circuits and said force distribution members;

closing said clip members; and

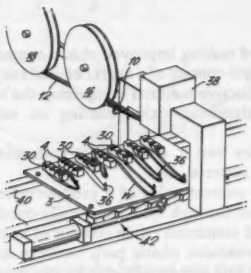
mechanically holding said flexible circuits in position with the force applied by said closed clip member to said flexible circuits and said electrical component.

4,060,890

METHOD OF MANUFACTURING AN ELECTRICAL HARNESS

Helen Dechelette, St. Cloud, and Jean Claud Joly, Osny, both of France, assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 682,924, May 4, 1976, Pat. No. 4,026,629.
This application Jan. 4, 1977, Ser. No. 756,656
Claims priority, application France, May 12, 1975, 75.14747
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **7 Claims**



1. A method of manufacturing an electrical harness comprising wires connected to electrical terminals of a plurality of electrical connectors, according to a desired wiring pattern, each terminal comprising a wire connecting portion formed integrally with a contact portion for mating with a complementary electrical terminal member, in which method, the wires are laid out on a wiring layout board, with the aid of wire guiding means, to form the desired wiring pattern and are subsequently connected electrically, to the terminals of the connectors, the wire being first laid in notches in the housings of the connectors, which housings are disposed on the board, after which the terminals are inserted into through openings in the housings through first ends of the openings, electrically to connect the wires to the wire connecting portions of the terminals and are secured in the openings with the contact portions of the terminals positioned to receive mating terminal members inserted through second ends of the openings in the housings.

4,060,891

WIRE STRIPPER

Henry C. Lerner, 1220 Sunset Plaza Drive, Los Angeles, Calif. 90069

Filed June 21, 1976, Ser. No. 697,972
Int. Cl.² B26B *27/00*; H02G *1/12*
U.S. Cl. 30—90.1 **11 Claims**

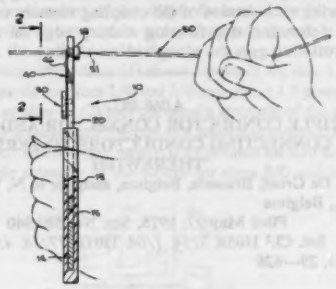
1. A wire stripper device comprising:

a support member have a flat back surface,

a die mounted on the upper end of said support member, said die having a guide hole therethrough with a square corner on the rear upper edge thereof lying in the plane of the back surface of the support member,

an elongated flat flexible blade having a notched cutting edge on the upper end thereof, and

clamping means for clamping the lower end of the blade to the back surface of said support member with the upper cutting edge of the blade lying in the plane of said flat back surface and spaced from the upper edge of the guide hole to provide an opening which is of a size to pass the



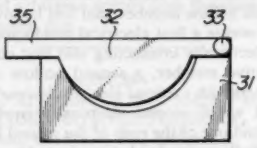
bare wire but not the insulation coating of a conductor to be stripped.

4,060,892

CUTTER FOR SEMICYLINDRICALLY CURLED PAPER

Takajiro Kondo, Yasugi; Toshitaka Asamoto, Matsue, and Tsutomu Oki, Yasugi, all of Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Feb. 3, 1975, Ser. No. 546,691
Claims priority, application Japan, Nov. 1, 1974, 49-125522
Int. Cl.² B26B *13/00*
U.S. Cl. 30—253 **1 Claim**



1. A cutter adapted for cutting paper or the like in a semicylindrically curled state, comprising a stationary blade having a cutting edge of semicircular concave contour, a movable blade having a cutting edge with a semicircular convex periphery, a spring-loaded pin means pivotally connecting the stationary and movable blades at one end for forcing both blades in pressure contact with each other, wherein the movable blade has a handle at its other end for a manual cutting operation and the pivotal connection of the blades is outside the locus of points defining the concave and convex surfaces, and the radius of the semicircular periphery of the movable blade is smaller than the radius of the semicircular contour of the stationary blade and the centers of these radii are arranged such that the distance between the centers of the radii is greater than the difference between the blade radii so that the two blades are always in cutting contact at only one cutting point at any instant of time during a cutting operation and at the beginning of a cutting stroke the cutting edges are in single point contact at their ends opposite the pivotal connection.

4,060,893

CUTTER

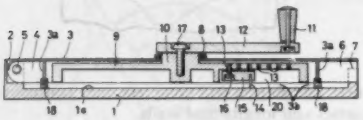
Haruo Matsuura, Tokyo, Japan, assignor to Kabushiki Kaisha Daisho, Japan

Filed Feb. 13, 1976, Ser. No. 658,064
Int. Cl.² B26B *3/00*; B26D *7/02*
U.S. Cl. 30—310 **3 Claims**

1. A sheet cutting device for cutting sheets into a circular form, comprising

a base having a flat upper base surface and having a bracket upstanding from the surface;

a frame pivoted to the bracket for angular pivoting movements between a raised position and a lower position, the frame having a sidewall secured thereto and the sidewall having a pad thereon at a free edge of the sidewall remote from the frame for engaging, in the lower position of the frame, a sheet lying on the base surface to determine the lower position of the frame, to hold the sheet, and to



provide a gap between the base surface and the frame, the sidewall and pad being disposed to surround the gap; and

a rotor rotatably mounted on the frame for rotation in the gap, having a handle for effecting the rotation, and having a cutting edge extending to the base surface when the frame, with the rotor and the knife thereon, is in the lower position, for cutting the sheet into a circular form by the rotation of the rotor and knife relative to the sheet held by the pad.

4,060,894

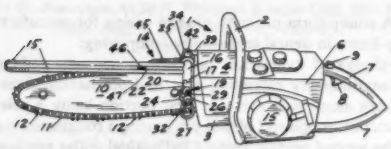
CHAIN SAW SAFETY BAR

Harvie G. Hampton, 1863 S. Brookwood, Shreveport, La. 71108

Filed Dec. 15, 1976, Ser. No. 750,665

Int. Cl.² B27B *17/02*

U.S. Cl. 30—382 **10 Claims**



1. A chain saw safety bar for a chain saw comprising:

a. a shaft carried by said chain saw;

b. a bar latch rotatably mounted on said shaft and having a bar latch tip and a bar latch recess on one end thereof;

c. a U shaped safety bar carried by said bar latch and extending above and essentially parallel to the chain and chain bar of said chain saw;

d. bar latch lock means slidably mounted on said shaft and having a bar latch lock tip and a bar latch lock recess cooperating with said bar latch tip and said bar latch recess of said bar latch to freely permit said bar latch and said U shaped safety bar to rotate upwardly with respect to said chain and said chain bar and to releasably permit said bar latch and said U shaped safety bar to rotate downwardly on said shaft;

e. safety bar bias means in said chain saw safety bar to bias said safety bar in essentially parallel relationship with respect to said chain and said chain bar; and

f. retaining means in cooperation with said bar latch to prevent sliding movement of said bar latch on said shaft.

4,060,895

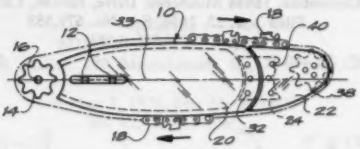
NON-SYMMETRICAL BAR WITH REVERSIBLE BODY PORTION

Arvin A. Hille, Lake Oswego, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.

Filed Nov. 15, 1976, Ser. No. 741,550

Int. Cl.² B27B *17/04*

U.S. Cl. 30—384 **1 Claim**



1. A chain saw guide bar comprising: a main body portion and a nose portion, said main body portion including means for attaching said main body portion to a chain saw housing with the rearward end adjacent the drive sprocket of the chain saw for driving a saw chain around the guide bar to be guided along the side edges thereof, and releasable connecting means for connecting the nose portion to the forward end of the main body portion, said main body portion forming the major portion of the guide bar being symmetrical about a center line lengthwise of the main body portion where by the side edges are invertible, said nose portion forming a smaller portion relative to the main body portion and having a curved edge formed around the outer end adapted to connect with the side edges of the main body portion to provide a continuous supporting edge for a saw chain from the rearward end along one of said side edges, around the nose portion and back to said rearward end along the other of said side edges, the portion of said curved edge on the top of the nose portion being sharply curved to reduce kick back and the portion of said curved edge on the bottom of the nose portion being relatively gradually curved, and said connecting means connecting the nose portion to the main body portion whereby the main body portion can be inverted relative to the nose portion.

4,060,896

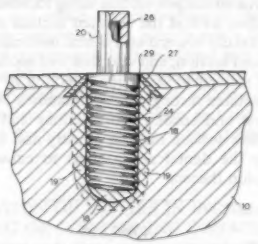
PROSTHODONTIC IMPLANT AND METHOD

M. Ervin Wahnish, 612 E. Church St., Orlando, Fla. 32801

Filed May 24, 1976, Ser. No. 689,102

Int. Cl.² A61L *13/00*

U.S. Cl. 32—10 A **9 Claims**



1. A prosthodontic implant for anchoring dental appliances in a jawbone socket, comprising:

a filler of a non-rejectable, hardenable material selected from the group consisting of poly-methyl methacrylate and methyl methacrylate disposed in said jawbone socket;

a member of a non-rejectable material selected from the group consisting of poly-methyl methacrylate and methyl methacrylate extending into said socket and through said filler, said member having undulations along the outer periphery thereof and dimensioned such that a portion of

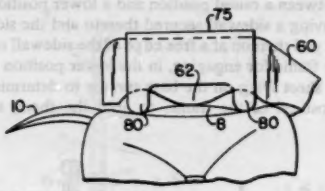
the outer periphery thereof engages a portion of the periphery of said jawbone socket; and wherein
said filler is interposed between portions of said shaft and the periphery of said jawbone socket and is homogenous with said shaft.

4,060,897
DEVICE FOR FORMING DENTAL RESTORATIONS
Jean Greenstein, 16844 Mooncrest Drive, Encino, Calif. 91436
Filed Apr. 23, 1976, Ser. No. 679,553
Int. Cl.² A61L *3/00*
U.S. Cl. 32—40 R **28 Claims**

1. A tool for forming dental restorations used in the oral cavity of a human being and which dental restorations are formed from a composition comprised of a hardenable material and a liquid and which will harden when the liquid is substantially removed therefrom, said tool comprising an elongate handle section capable of being grasped by the fingers of the user thereof, a first tool section on one portion of said handle section used in the formation of dental restorations from a synthetic restoration material, a second tool section on another portion of said handle section cooperatable with said first tool section and used in the formation of the dental restorations from the synthetic restoration material and which first and second tool sections are used in combination to form the dental restorations, and a serrated surface section associated with said elongate handle section and being located in very close proximity to said first tool section and substantially spaced from said second tool section along the length of said handle section, said serrated section being comprised of a plurality of axially spaced apart radially extending ring elements having rounded outer edges which are separated by rounded recessed grooved portions, each of said ring elements being diametrally reduced in successive relationship to one another over the overall length of serrated surface section such that the largest of said ring elements is spaced furthest from the first tool section and the smallest of the ring sections is located closest to the first tool section, said serrated surface section being effective in creating vibratory action on the composition during molding thereof to form the dental restorations through reciprocative movement to further aid in the retention of the liquid in the hardenable material during the formation of the dental restorations, said serrated surface section being located relative to said first tool section so that the serrated section may be immediately shifted axially toward said dental restorations after action by said first tool section, and said first tool section being axially located with respect to said handle section so that said dental tool may be rotated through approximately a 180° arc to utilize both said first and second tool sections and such that said serrated surface section may be quickly and easily located in proximity to the dental restorations to cause an additional vibratory action thereon.

4,060,898
CLIP-ON DENTAL RESTORATION AND TOOLS FOR REMOVING SAME
William C. Orthwein, P.O. Box 3332, Carbondale, Ill. 62901
Division of Ser. No. 613,196, Sept. 15, 1975, abandoned. This application June 4, 1976, Ser. No. 692,759
Int. Cl.² A61C *13/12*
U.S. Cl. 32—40 R **2 Claims**

1. A tool for applying inward pressure to the longitudinal walls of a removable dental restoration comprising a pair of gripping handles, each of said handles having a jaw formed at one end thereof, the face of each jaw having a rigid central convex portion defined by adjacent channels and each said channel having located therein a resiliently compressible locating finger extending so that when said jaws are closed on said



restoration, said fingers will compress until said convex portions contact said longitudinal walls.

4,060,899
DOWEL PIN WITH SOCKET FOR THE MANUFACTURE OF DOWEL MODELS IN DENTAL TECHNOLOGY
Richard Sauter, Richard Stocker St. 15, D7707 Engen, Germany
Filed May 17, 1976, Ser. No. 687,210
Claims priority, application Germany, May 15, 1975, 2521573
Int. Cl.² A61C *13/00*
U.S. Cl. 32—11 **12 Claims**

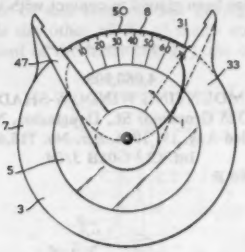
1. A stump-form pin with plug-in casing for manufacturing stump-forms in dental technology comprising:
an elongated cylindrical pin having opposite ends and a longitudinally extending axis, said pin having three portions along said axis, the first portion being a retention portion at one end of said pin having a roughened surface, the second portion being a cylindrical collar portion having a diameter larger than said retention portion and a secant-area segment removed; the third portion being a pin shaft portion forming the other end of said pin, said pin shaft portion having a diameter smaller than that of said collar portion; and
a casing for receiving said pin and adapted to be embedded into a plaster-impression, said casing having a cylindrical bore along a longitudinally extending axis, said bore having two portions and a dead end, the first portion of said bore having said dead end and a diameter approximately the same as the diameter of said pin shaft portion of said pin and the second portion of said bore being approximately the same diameter as the diameter of said collar portion of said pin and having an inward secant-area projection complementing the secant-area segment removed from said collar portion for the purpose of securing the pin against axial rotation when said pin is inserted into said casing, said casing having at least one annular groove in its outer surface coaxially with said axis of said casing.

4,060,900

ANGLE MEASURING DEVICE

Michael Peter Greenwood, Breckenborough Hall, Thirsk, Yorkshire, England

Filed June 3, 1976, Ser. No. 692,422
Claims priority, application United Kingdom, June 26, 1975, 27120/75
Int. Cl.² G01B 5/24
U.S. Cl. 33—75 R 1 Claim



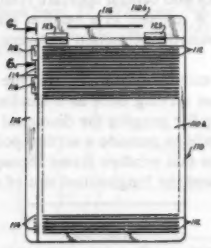
1. A device for measuring or marking out angles comprising two discs, each having curved margins extending for most of the periphery thereof, each disc having a slit extending from its center to its periphery along a path defining with a radius a tongue portion, said discs being superimposed so that the tonque portions face and overlie each other, limiting means fixed to each disc at a location radially beyond the curved margin therein and extending in overlying relationship to the other disc and means passing through said limiting means and said discs to mount said discs for relative rotation about a common axis from a closed position in which all but the tongue of each disc lies on one side of the other disc to a position in which further rotation is prevented by said limiting means, the margin of the surface of a disc which faces the surface of the other disc having a scale thereon so that as the discs are moved from the closed position the scale is progressively revealed.

4,060,901

TEMPLATE FOR LINING SHEET MUSIC PAPER

Donald W. Jamerson, 4120 N. Belmont, Kansas City, Mo. 64117

Filed Aug. 2, 1976, Ser. No. 710,646
Int. Cl.² B43L 13/02
U.S. Cl. 33—108 11 Claims



1. A template device for use in marking a plurality of closely spaced lines arranged in a plurality of spaced apart groups each containing a preselected number of lines, said device comprising:

a template presenting a plurality of substantially parallel slots each adapted to receive and guide a marking instrument, said slots being spaced closely and substantially uniformly apart from one another;

a plurality of guides for indicating separate groups of slots, said guides each having a length to substantially span said preselected number of slots; and

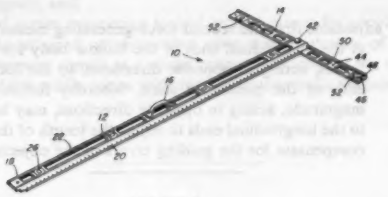
means for attaching said guides releasably to said template at locations spaced apart from one another with each guide substantially spanning a group of slots containing said preselected number of slots, whereby the group of slots indicated by each guide may be spaced apart from the groups of slots indicated by the other guides.

4,060,902

MULTI-PURPOSE TOOL

Gerbert O. Keller, 180 Mattakeesett St., Pembroke, Mass. 02356

Filed May 7, 1976, Ser. No. 684,025
Int. Cl.² B43L 7/00
U.S. Cl. 33—114 5 Claims



1. A multi-purpose tool, comprising

a. a relatively thick, stiff and straight elongated body formed with parallel bevelled faces adjacent each long edge thereof and one one side thereof,

b. said body being marked with measuring indicia along at least one long edge thereof and on the bevelled face thereof,

c. a handle mounted medially to said one face of said body,

d. said body being formed with a plurality of longitudinally spaced sockets in said one face,

e. a bubble level mounted in each of said sockets,

f. first fastening means detachably securing each of said bubble levels in said socket,

g. at least one end of said body being formed with a pair of transverse grooves defining a stepped transverse notch across the other face of said body,

h. a T-bar of L-shaped cross-section to conform in size and profile with said notch, and,

i. second fastening means detachably connecting said T-bar in said notch perpendicular to the length of said body,

j. said T-bar being formed with a flat, straight portion having a thickness and width corresponding to the depth and width of one portion of said groove and a lip along one edge thereof corresponding in thickness and width to the depth and width of the other of said grooves, whereby the outer face of said T-bar will be flush with the other face of said body when connected thereto and the end of said body will be flush with the outer edge of said T-bar.

4,060,903

COMPENSATION OF ERRORS IN INCREMENTAL MEASURING OR POSITIONING INSTRUMENTS

Alfons Ernst, Traunreut, Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

Filed Apr. 22, 1976, Ser. No. 679,170
Claims priority, application Germany, Apr. 26, 1975, 2518745
Int. Cl.² G01B 11/04
U.S. Cl. 33—125 R 15 Claims

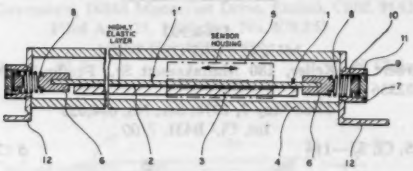
1. A digital electrical measuring instrument for measuring or adjusting the relative position of two objects which compensates for the guiding errors of the two objects, comprising:

a longitudinally extending, bending resistance hollow body having means for attachment to one of the objects;

a longitudinally extending, bending resistant measuring scale

within the hollow body, fastened to the hollow body by a highly elastic layer interposed between only a single surface of the scale and the adjacent surface of the hollow body;

a scanning head within the hollow body, having a connecting means extending out of the hollow body for attachment to the other object; and



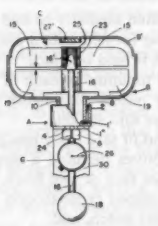
adjustable first and second force-generating means mounted at the longitudinal ends of the hollow body for applying forces, acting in opposite directions, to the longitudinal ends of the measuring scale, whereby forces of equal magnitude, acting in opposite directions, may be applied to the longitudinal ends to adjust the length of the scale to compensate for the guiding errors of the objects.

4,060,904

MEASURING ASSEMBLY FOR TURBINE THRUST BEARINGS

William K. Hiss, 7101 Belair Road, Baltimore, Md. 21206

Filed June 24, 1976, Ser. No. 699,434
Int. Cl.[2] G01B *3/22*
U.S. Cl. 33—172 R **3 Claims**



1. In a transmission torque converter comprising a casing having an opening therein, a bearing supporting a turbine having a central bore therethrough carried within said casing, and a hollow hub fixed about said casing opening of a larger diameter than the turbine bore and having at least its outer surface perpendicular and on the same axis as said turbine bore, an assembly for measuring the end play of said bearing, said assembly comprising:

a. a base having parallel upper and lower surfaces, each of said surfaces being in a single parallel plane, the upper surface of the base being adapted to receive the outer end of the casing supporting hub, means for supporting the base in a substantially horizontal plane, said base having an aperture extending therethrough, the walls of the aperture being substantially perpendicular to at least the upper surface of the base;

b. a spindle of smaller diameter than the diameter of the hollow hub and adapted to slide through said aperture in the base;

c. the upper end of the spindle being cone-shaped and tapered inwardly toward its outer upper end adapted to engage one end of the said turbine bore;

d. a gauge-supporting bracket having an aperture therethrough adapted to normally slide along said spindle and positionable on said spindle below the base, said bracket having means for releasably fixing the bracket to the spindle at selected locations;

e. a measuring gauge fixedly supported upon said gauge-supporting bracket having operatable means adapted to engage the underside of the said base for operating the same for measuring the movement of the spindle through the aperture in the base,

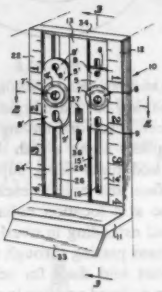
whereby the end play in the turbine bearing may be recorded on the gauge upon the upward movement of the spindle after its upper end has been placed in contact with the hub bore of the turbine.

4,060,905

GAUGE FOR MOUNTING WINDOW-SHADE BRACKETS

Stanley Light, 325 Grosvenor St., Douglaston, N.Y. 11363

Filed Aug. 19, 1976, Ser. No. 715,673
Int. Cl.[2] G01B *3/04*
U.S. Cl. 33—180 R **13 Claims**



1. A guage for determining the proper mounting locations for apertured magnetically attracted mounting brackets for roller window-shades within window frames, comprising,

a. a substantially flat elongated guide member adapted to be positioned vertically on a window frame,

b. a track of uniform width on the outer face of said guide member comprised of a pair of elongate supports of paramagnetic material with a longitudinal slot therebetween coincident with the locus of the free movement of a central aperture in the bracket in the course of its freely adjustable movement along the track to a position providing adequate clearance for the fully rolled-up window-shade,

c. a lineal scale adjacent to one of said supports for noting the position of said central aperture relative thereto while said bracket is retained in a vertical plane solely by the force of magnetic attraction between said track and bracket, and

d. a projection extending laterally from the outer face of said guide member serving both as a handle for the latter as well as a stop for gauging the diametral dimension of the rolled up shade to provide a setting point for a marking impression on said window frame through an aperture of the bracket and the longitudinal slot of said track.

4,060,906

CENTERING APPARATUS FOR SENSING ALIGNMENT OF ENGAGING, ALIGNED MACHINE ELEMENTS, TYPICALLY SCREWS AND BOLTS WITH NUTS

Frieder Heizmann, Echichens, Switzerland, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

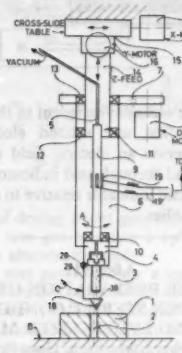
Filed Aug. 19, 1976, Ser. No. 715,713
Claims priority, application Germany, Sept. 11, 1975, 2540494
Int. Cl.[2] G01B *5/25*
U.S. Cl. 33—181 R **13 Claims**

1. Centering apparatus for centric alignment of engaging, aligned machine elements having a respective projecting part

and a matching bore such as bolts, screws and nuts, and comprising

movable means (15, 16, 17) holding one of said elements and movable in a plane perpendicular to the axis of said one element in response to input signals to axially align it with the other of said elements and means (14) to axially move said elements with respect to each other,

a conical centering feeler (18, 18') carried by said movable means located in axial alignment with the central axis of said one of said elements and having its axis directed towards the other of the elements so that, upon axial movement of the feeler (18, 18'), the other element will



engage the conical feeler at a side wall of the cone and deflect the same if misaligned;

laterally flexible means (9) carried by said movable means holding said feeler (18, 18') in said axially aligned position while permitting lateral deflection thereof;

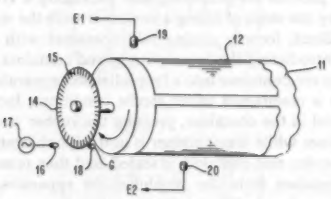
and sensing means (19) operatively associated with said flexible holding means (9) and sensing lateral deflections thereof, and providing deflection output signals, said deflection output signals being connected to said movable means (15, 16, 17) to control said movable means to move until the deflection output signals become zero or null, indicative of axial alignment of said elements.

4,060,907

MEDIA SKEW COMPENSATOR

Danny Allen Van Hook, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 27, 1976, Ser. No. 726,892
Int. Cl.² B41B *27/42*
U.S. Cl. 33—184.5 **5 Claims**



1. In a printer including a print media support and a plurality of print elements arranged to traverse the print media support in a first direction while the print media support moves cyclically in a substantially orthogonal second direction, circuit means for providing a signal indicative of the location of a print media mounted on the print media support comprising:

first sensor means movable in conjunction with said print elements and providing a first signal upon detecting the first of two parallel print media edges;

second sensor means fixed with respect to said media support for providing a second signal upon detecting the first of two parallel print media edges which are oriented substantially orthogonal to the edges sensed by the first sensor means;

first means operating in synchronism with said media support for providing a fixed plurality of signal pulses in each cycle of media support movement;

counter means responsive to said second signal for resetting under control thereof;

second means responsive to said first means and the said first signal for providing stepping signals to the said counter means under control of said first means output and for discontinuing said stepping signals in response to said first signals; and,

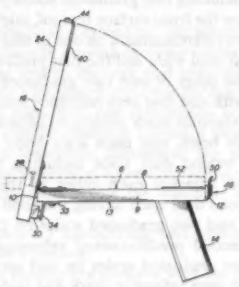
third means responsive to said second means for providing the attained counter value upon discontinuance of said stepping signals as a preset output indicative of the skew of the media edges with respect to the media support.

4,060,908

SIGHTING DEVICE FOR RELOCATION OF SITE

Robert M. Skallerup, P.O. Box 160, Cary, Ill. 60013

Filed Nov. 11, 1976, Ser. No. 741,035
Int. Cl.² G01C *21/00*
U.S. Cl. 33—275 R **7 Claims**



1. A folding site relocator to visualize reference points identifying intersecting lines, said recorded reference points being relocated through visualization to subsequently re-establish intersecting lines and relocate the site, including an elongated base member having a near eye sighting end, a remote eye sighting end and a fixed sighting element mounted at the near eye sighting end thereof; an elongated sighting member pivotally affixed at one end thereof to said remote eye sighting end of said base member, said sighting member having an opening therein adjacent a top side of said base member, a fixed sighting line in said opening and a sighting mirror having thereon a vertical index line mounted on said sighting member above said fixed sighting line, said fixed sighting element on said base member, said opening with said fixed sighting line therein and said sighting mirror with said vertical index line thereon all being aligned in the same vertical plane to permit a reference point and a linearly opposite reference point to be simultaneously identified to establish a reference line, whereby a reference point can be located by establishing a first and a second reference line which intersect one another.

4,060,909

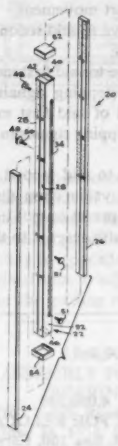
SURVEYING ROD

Eugene C. Collins, East Star Rte. Box 196; Stephen E. Collins, Rte. 1 Box 39, and David N. Collins, 621 W. 15th St., all of Portales, N. Mex. 88130

Continuation of Ser. No. 554,989, March 3, 1975, abandoned. This application Mar. 2, 1976, Ser. No. 663,291

Int. Cl.[2] G01C *15/06*

U.S. Cl. 33—296 **3 Claims**



1. A surveying rod which permits direct reading from first and second predetermined reference elevation marks comprising a main elongated scale body having a front surface with a first dual scale including two graduated scales positioned adjacent each other on the front surface thereof, said first dual scale having a first zero reference mark on one of said two graduated scales on the first dual scale and the first predetermined reference mark on the other of said two graduated scales on said first dual scale with said first zero reference mark and said first predetermined reference mark positioned adjacent a lower end of the main scale body, said main scale body having a back surface with a second dual scale including two graduated scales positioned adjacent each other in the back surface thereof, said second dual scale having a second zero reference mark on one of said two graduated scales on the second dual scale and the second predetermined reference mark on the other of said two graduated scales on said second dual scale with said second zero reference mark and said second predetermined reference mark positioned centrally of the main scale body, and adjustable support means connected to the main scale body for positioning said first zero reference mark on the main scale body in visible locations adjacent a lower edge of the support means and at predetermined heights above the lower edge of the support means wherein the main scale body is an elongated tube open at both ends and has a first elongated slot on one side of the main scale body and wherein the support means comprises an elongated foot member slidable within the main scale body and a locking means attached to the foot member and slidable within the first elongated slot for locking the support member in any desired position.

4,060,910

ORIENTATION SYSTEM

Harold A. Gell, Jr., 13720 Lockdale Road, Silver Spring, Md. 20906

Filed Nov. 23, 1976, Ser. No. 744,325

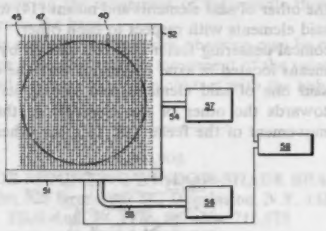
Int. Cl.[2] G01C *17/26, 19/00*

U.S. Cl. 33—324 **62 Claims**

1. A relative azimuth indication system, comprising:

an indicator including an image area optically responsive to an electric field;

a first electrode assembly adjacent to the viewing side of said indicator;



a second electrode assembly adjacent to the rear side of said indicator, said first and second electrode assemblies adapted to generate an electric field at selected points therebetween and through said indicator image area; and

a means to rotate said indicator relative to at least one of said electrode assemblies.

4,060,911

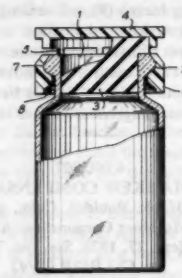
PROCESS FOR THE PREPARATION OF A CONTAINER CLOSED UNDER STERILE CONDITIONS AND CONTAINING LYOPHILIZED MATERIAL

Herbert Weiler, Marburg, Marbach; Hans Schneider; Wolfgang Von Janecek, both of Marburg an der Lahn, and Ludwin Weyrich, Buchenau, all of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany

Filed Aug. 7, 1975, Ser. No. 602,911

Int. Cl.[2] B65B *31/04;* B67B *3/22, 3/24;* F26B *5/06*

U.S. Cl. 34—5 **1 Claim**



1. In a process for preparing and packaging a lyophilized material by the steps of filling a container with the material to be lyophilized, loosely closing said container with a rubber stopper, introducing the loosely-stoppered container with the material in the container into a lyophilization apparatus, which apparatus is maintained under sterile conditions, lyophilizing the material in the container, pressing the rubber stopper into the container while the container is in the lyophilization apparatus, whereby said container is sealed, and then removing the sealed container from the lyophilization apparatus, the improvements wherein (1) said container has an external circumferential bead thereon, (2) a snap-on closure cap having an internal circumferential groove sealably engageable with said bead on said container is also loosely placed on said container over said rubber stopper before the loosely-stoppered container is introduced into said lyophilization apparatus, and (3) said closure cap is simultaneously pressed into snap-on sealing engagement with said container, over said rubber stopper, as said rubber stopper is pressed into the container, whereby said

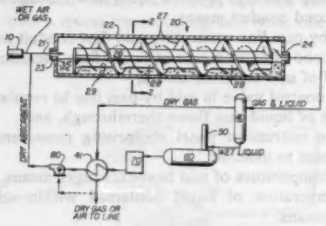
container is provided, under sterile conditions, with a snap-on closure cap over said rubber stopper.

4,060,912

ABSORBER-CONTACTOR

Frank M. Black, 5112 Clay, Houston, Tex. 77023

Filed Sept. 15, 1976, Ser. No. 723,509
Int. Cl.² F26B *3/00*
U.S. Cl. 34—9 **11 Claims**



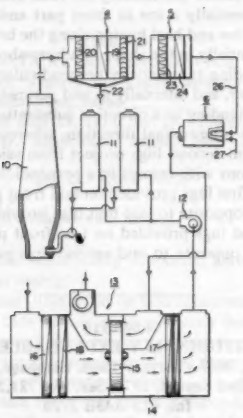
10. A method of drying a wet gas, comprising the steps of:
a. causing said wet gas to enter a cylinder only partially filled with an absorbent liquid;
b. causing said wet gas to follow a tortuous cyclical path through said cylinder, part of each cycle of said path being through said absorbent fluid and part of each cycle of said path being without said absorbent fluid;
c. causing said wet gas and at least a portion of said absorbent liquid to follow concurrent paths and exit said cylinder and to enter a series connected separator.

4,060,913

ASSEMBLY FOR DEHYDRATING AIR TO BE SUPPLIED TO BLAST FURNACE

Toru Yoshida, Hachioji; Kameo Hosoi, Warabi; Tokuzo Yoshida, Oita; Kazuyuki Shimizu, Bungotakada, and Koithiro Nakagawa, Oita, all of Japan, assignors to Takasago Thermal Engineering Co., Ltd and Nippon Steel Corporation, Japan

Filed Aug. 2, 1976, Ser. No. 710,567
Int. Cl.² F26B *21/06*
U.S. Cl. 34—80 **6 Claims**



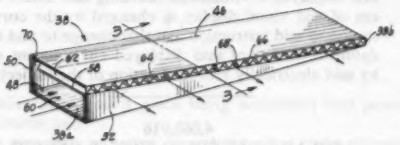
1. A dehydration assembly for dehydrating atmospheric air at the input side of a blower for use in the operation of a blast furnace, comprising:
a casing, the inside space of which is divided into regenerating and dehydrating zones by a partition plate;
at least one gas permeable rotor containing a regenerative moisture absorbent impregnated therein rotatably mounted in said casing so as to radially extend across the cross-sections of said regenerating and dehydrating zones, said rotor having two opposing flat surfaces with a clearance therebetween;
a pre-cooler located in said dehydrating zone upstream of said rotor;
an after-cooler located in said dehydrating zone downstream of said rotor;
a relative humidity regulator located in said dehydrating zone between said pre-cooler and said rotor;
piping means for circulating a heat transfer medium through said relative humidity regulator and said after-cooler;
a conduit for passing the dehydrated air leaving said after-cooler to the input side of the blower, and;
a conduit for introducing a hot combustion gas, obtained in a combustion device for burning a waste gas containing inflammable components, into said regenerating zone.

4,060,914

APPARATUS FOR TREATING MATERIAL WITH A GASEOUS MEDIUM

Charles E. Hoffman, Hatboro, Pa., assignor to Proctor & Schwartz, Inc., Philadelphia, Pa.

Filed Aug. 18, 1976, Ser. No. 715,419
Int. Cl.² F26B *3/04, 13/02*
U.S. Cl. 34—219 **9 Claims**



1. In a longitudinally extending gas treating apparatus including longitudinally moving carrying means for transporting goods to be gas treated through said apparatus, the improvement comprising a gas distribution box for dispensing a gaseous medium in said apparatus, said distribution box comprising
at least one plenum chamber having a longitudinal dimension and a transverse dimension, the plenum chamber longitudinal dimension extending laterally within the gas treating apparatus across the width of the goods being treated;
gas inlet means for introducing said gaseous medium into said plenum chamber;
a nozzle substantially coextensive with the plenum chamber in the plenum chamber longitudinal dimension;
means dividing the nozzle into a plurality of parallel, straight channels oriented towards the goods being treated, each channel having an inlet end and an exhaust end; and
means defining an elongated, constricted, substantially continuous slot substantially coextensive with the plenum chamber and nozzle communicating the plenum chamber with said channel inlet ends;
the slot being sufficiently narrow to establish a pressure differential between the plenum chamber and the nozzle.

4,060,915

MENTAL IMAGE ENHANCEMENT APPARATUS UTILIZING COMPUTER SYSTEMS

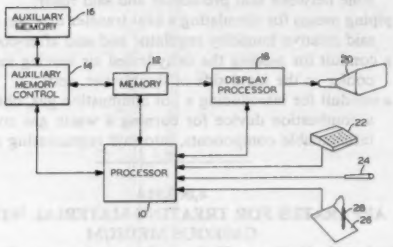
Malcolm J. Conway, Main Road, Gill, Mass.

Filed Aug. 2, 1976, Ser. No. 710,808
Int. Cl.² G09B *7/04*
U.S. Cl. 35—9 A **37 Claims**

1. In a method for developing an individual's capacity to form and utilize accurate mental images of data to which he has been previously exposed, the steps comprising:
a. providing an electrically generated visual display of an

environment simultaneously including a plurality of distinctive datum references within the displayed environment which may be acted upon by the subject and means for manipulation by the subject to electrically record his action to change any one of said distinctive datum references of said visual display;

b. providing an instruction to the subject requiring an action with said manipulatable means to change at least said one of the datum references of said visual display;



c. electrically recording invisibly to the subject his action in response to the instruction to change any one of said datum references of said visual display; and

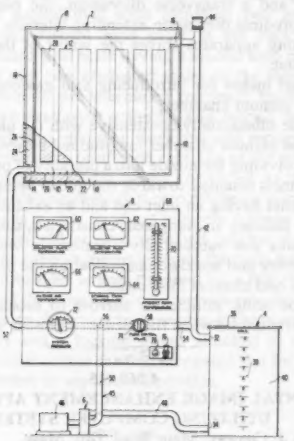
d. subsequently presenting to the subject for comparison an electrically generated visual display of said displayed of said displayed environment including said datum references of said visual display as changed by the correct response to said instruction and that change to said any one datum reference of said displayed environment effected by said electrically recorded action of the subject.

4,060,916

SOLAR HEAT EDUCATIONAL DEVICE

George D. Finigan, Ballston Spa; Brian E. May, and Henry W. Zaininger, both of Ballston Lake, all of N.Y., assignors to Systems Using Nature Ltd., Ballston Lake, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,111
Int. Cl.² G09B *25/00*
U.S. Cl. 35—10 **10 Claims**



1. An educational device for use in instruction concerning solar heat utilization which comprises:

A. solar energy collector means comprising a chamber portion to contain liquid to be heated by solar energy absorbed by said collector means, a liquid flow inlet to said chamber portion, a liquid flow outlet from said chamber portion, and heat-exchanger means to assist in transfer of heat absorbed by said collector means to said liquid,

B. a liquid storage tank separate from said collector means having a fluid flow inlet and a fluid flow outlet,

C. first conduit means connecting said collector means outlet to said storage tank inlet for circulating liquid from the collector means to the storage tank,

D. second conduit means connecting said storage tank outlet to said collector means inlet for recycling liquid from the storage tank to the collector means,

E. pump means to produce liquid flow through said first and second conduit means,

F. a by-pass line connecting said first conduit means to said second conduit means of liquid flow therethrough external of said collector means,

G. a control valve in said by-pass line to regulate the quantity of liquid that flows therethrough, and

H. an instrument panel comprising measurement display means to indicate:

a. temperature of said heat-exchanger means,

temperature of liquid contained within said collector means,

c. temperature of liquid contained in said storage tank, and

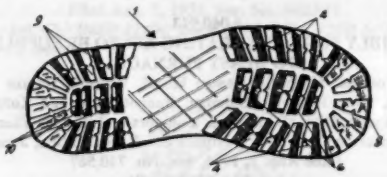
d. pressure of liquid flowing in said second conduit means.

4,060,917

SOLE STRUCTURE PARTICULARLY FOR CLIMBING-BOOTS

Romolo Canale, Via Pastrengo, 3, Padova, Italy

Filed July 12, 1976, Ser. No. 704,681
Int. Cl.² A43B *23/28*
U.S. Cl. 36—59 C **1 Claim**



1. A sole structure particularly for rock climbing footwear comprising essentially a toe or front part and a heel or rear part, both said toe and heel having along the bottom perimeter thereof, substantially in the shape of a horseshoe, a plurality of first lugs extending substantially perpendicularly with respect to said perimeter, and internally to said perimeter a plurality of second lugs extending in a direction substantially perpendicular to said sole longitudinal direction, wherein said first lugs and the adjacent second lugs project from said sole with opposed inclinations with respect to a perpendicular direction to said sole, said first lugs provided on said front part of said sole being inclined opposite to said first lugs provided on said heel and said second lugs provided on said front part of said sole being inclined opposite to said second lugs provided on said heel.

4,060,918

LONGITUDINALLY EXPANDABLE SHOE

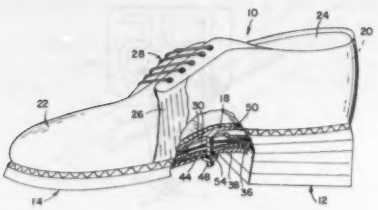
Albert Mandel, 3668 Courtney Lane, Bethpage, N.Y. 11714

Filed Sept. 8, 1976, Ser. No. 721,388
Int. Cl.² A43B *3/26*
U.S. Cl. 36—97 **2 Claims**

1. A longitudinally expandable shoe comprising:

a heel assembly joined to a longitudinal sole assembly, said heel and sole assembly each having a set of flexible plate-like portions respectively interleaving with one another, one set of said flexible plate-like portions having a plurality of coextensive longitudinal slots, the other set having a

plurality of holes aligned substantially at right angles to the plate portion planes, each of said sets of flexible plate-like portions including outwardly facing first and second portions, and further comprising first and second metal plates joined to said first and second plate-like portions respectively, at least one of said first and second metal plates being formed with a longitudinal slit, the other of said first and second metal plates being formed with a threaded opening, a threaded bolt screwed into said opening passing through said slit, said arch support means having a portion facing away from the foot and being formed with a recess for receiving said bold, one end of



said bolt being freely rotatable in said recess, and a nut screwed onto the other bolt end, whereby said arch support means is movable in directions toward and away from the other of said metal plates in dependence of the direction of ratation of said bolt, said nut serving to hold said bolt in a selected position;

height adjustable arch support means joined with one end thereof to one end of said heel and sole assemblies for supporting the foot of a wearer;

an upper having front and rear portions attached to said sole and heel assemblies respectively;

elastic means joining the upper front and rear portions.

4,060,919

DATA RETRIEVING DEVICE

Hiromichi Sasaki, Nagareyama, Japan, assignor to Kabushiki Kaisha Fuji Seisakusho, Japan

Filed July 19, 1976, Ser. No. 706,611

Claims priority, application Japan, July 28, 1975, 50-104280[U]

Int. Cl.² G09F *11/10*

U.S. Cl. 40—104 A **3 Claims**

1. In a data retrieving device having

a casing;

a rotational shaft horizontally supported between two side plates of said casing;

a pair of circular disks fitted on said rotational shaft;

a plurality of data indicating panels, each being supported hangingly around the periphery of said circular disks;

an electric motor to transmit rotational force generated by its rotation to said rotational shaft;

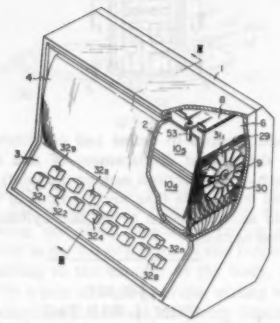
a plurality of data retrieving keys corresponding in number to said data indicating panels, said keys being arranged regularly on a key board; and

a short circuit means for said motor, the improvement comprising,

a. a contact piece provided at the side of one of said side plates to connect one end of said rotational shaft to a power source through said motor;

b. a switch-board for regulating the rotational angle of said motor, said switch-board being fixed on the other side plate opposite to said side plate where said contact piece is located, and having a rotary contact piece fitted at the other end of said rotational shaft and a plurality of fixed contact pieces arranged radially on a rotational locus of said rotary contact piece;

c. a plurality of normally closed type contact pieces for short-circuiting said motor circuit provided on one end of said keys, one end of each of said closed contact pieces being connected to each corresponding fixed contact piece on said switch-board, and the other end of



said each contact piece being connected said power source; and

d. a gear train provided on said side plate at the opposite side of said switch-board, said gear train transmitting rotational force of said motor to a gear fitted on said rotational shaft,

said rotational shaft being made of electrically conductive material, and forming a part of the electric circuit for said motor; and

each of said plurality of data retrieving keys having an engaging pawl thereon which is mechanically engaged with an engaging member when said key is pushed downward.

4,060,920

SIGNBOARD

Lindell N. Edwards, 10601 Leebur Drive, St. Louis, Mo. 63128

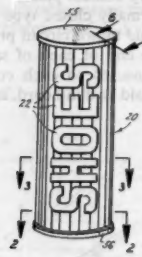
Filed Apr. 22, 1976, Ser. No. 679,214

Int. Cl.² G09F *7/02*

U.S. Cl. 40—140 **10 Claims**

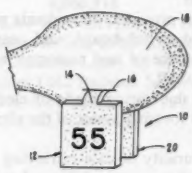
1. A signboard which is elongated and tubular and which is generally circular in cross section and which comprises a plurality of sections that are elongated and that are generally arcuate in cross section, said sections being disposed in edge-to-edge relation to make said signboard tubular and to define said circular cross section for said signboard, each of said sections having portions of the outer surface thereof coacting with portions of the outer surfaces of the rest of said sections to define a cylinder of generally circular cross section, each of said sections having the circumferentially-spaced elongated side edges thereof displaced radially inwardly of said cylinder of generally circular cross section, each of said sections having

interacting surfaces adjacent said inwardly-displaced elongated side edges thereof which mate with and coact with complementary surfaces adjacent said inwardly-displaced elongated side edges of abutting sections to interlock said sections together, said interacting surfaces adjacent said inwardly-displaced elongated side edges of said abutting sections



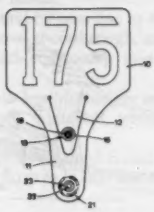
enabling said sections to define and constitute a frame-free signboard, the inward displacement of said elongated side edges of each of said sections making the joints between abutting sections less visible than said portions of said outer surfaces of said sections which define said cylinder of generally circular cross section.

4,060,921
ANIMAL EAR TAG
Owen R. Robinson, Rte. 2, Douglass, Kans. 67039
Filed Apr. 19, 1976, Ser. No. 678,130
Int. Cl.² G09F *3/12*
U.S. Cl. 40—301 **4 Claims**



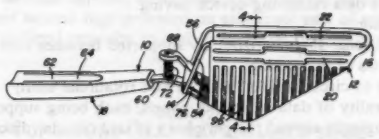
1. An animal identification ear tag, the tag comprising:
a flat angular shaped first ear piece member having an elongated neck portion integrally formed therein and extending outwardly therefrom, the neck portion of said first ear piece member inserted through a slit in the animal's ear;
a flat angular shaped second ear piece member substantially identical to said first ear piece member, said second ear piece member having an elongated neck portion integrally formed therein and extending outwardly therefrom;
a pair of apertures in the neck portion of said first ear piece member, said apertures in a spaced relationship to each other and along the length of the neck portion of said first ear piece;
a pair of apertures in the neck portion of said second ear piece member, said apertures in a spaced relationship to each other and along the length of the neck portion of said second ear piece member, the apertures of said second ear piece member indexed with the apertures of said first ear piece member; and
a "U" shaped staple, the ends of said staple inserted through the apertures of said first ear piece member and said second ear piece member and folded over thereby securing said first ear piece member to said second ear piece member, the neck portion of said second ear piece member includes a pair of raised portions adjacent the apertures in said second ear piece member, said raised portions are used in bending the end portions of said "U" shaped staple over in securing the staple to the neck portion of said second ear piece member.

4,060,922
ANIMAL IDENTIFICATION TAG
Charles Gerardus Reggers, Palmerston North, New Zealand, assignor to Delta Plastics Limited, Palmerston North, New Zealand
Filed Mar. 11, 1976, Ser. No. 666,059
Claims priority, application New Zealand, Mar. 12, 1975, 176913
Int. Cl.² G09F *3/00*
U.S. Cl. 40—302 **9 Claims**



1. A one piece resilient material identification tag for an animal comprising:
a flat identification panel;
a first attachment portion in the form of a panel narrower than said identification panel and extending therefrom;
a second attachment portion in the form of a flap centrally disposed in said first attachment portion panel and extending away from said identification panel, said first and second attachment portions being substantially coplanar with said identification panel; and
an upstanding headed spike and spaced apart from the spike a hole of smaller cross-sectional size than the largest cross-sectional size of the spike, said spike and hole being respectively part of said second and first attachment portions and positioned at different distances from the identification portion whereby the said first and second portions can be displaced from the plane of the identification portion so that the tag can be installed on the top of the ear of an animal, with the identification part in a vertical attitude, by passing the head of the spike through the ear and into said hole.

4,060,923
MINNOW DIPPER
Louis S. Schmitz, Rte. No. 1, Hankinson, N. Dak. 58041
Filed Oct. 12, 1976, Ser. No. 731,567
Int. Cl.² A01K *97/00*
U.S. Cl. 43—4 **9 Claims**



1. A dipper construction including a body defining an upwardly opening receptacle having a bottom defining drain passages therethrough, said bottom including adjacent relatively and oppositely inclined bottom sections defining an upwardly opening included angle of between 90° and 180°, a hold-down member including opposite marginal edge portions, one of said marginal edge portions being pivotally supported from the marginal edge of one of said sections remote from the other section for swinging about an axis generally paralleling

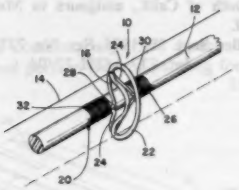
said one marginal edge portion and said marginal edge between an active position with said hold-down closely overlying the upper surfaces of said one section and an inactive position with the other of said opposite marginal edge portions elevated above said bottom.

4,060,924

FISHING POLE EYE

Leroy G. Cunningham, 1515 S. 118th E. Ave., Tulsa, Okla. 74128

Filed May 17, 1976, Ser. No. 686,749
Int. Cl.² A01K 87/04
U.S. Cl. 43—24 1 Claim



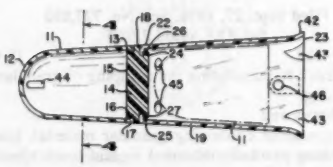
1. An eye for a fishing pole having a fishing line and comprising attachment means engageable with the outer periphery of the pole for securing the eye thereto, and elongated arcuate loop means carried by the attachment means, said loop means including an arcuate opening of substantially constant width through the length thereof and having an internal length sufficiently long to surround slightly more than one half the circumferential distance around the outer periphery of the pole for receiving the fishing line therethrough, said attachment means comprising an open saddle member having an arcuate configuration complementary to the configuration of the outer periphery of the pole for engagement therewith, oppositely disposed outwardly extending arm members engageable with the outer periphery of the pole and extending longitudinally therealong, and winding means wound around the outer periphery of the pole and the arm members for securing the eye to the outer periphery of the pole, said saddle member including a pair of oppositely disposed substantially V-shaped elements, and said arm members each including a pair of abutting arm members each being integral with the respective V-shaped element.

4,060,925

FISHING BOBBER AND BAIT GUARD

Arnett Bias, Cuyahoga Falls, Ohio, assignor to Bait Guard Inc., Cuyahoga Falls, Ohio

Filed July 8, 1976, Ser. No. 703,523
Int. Cl.² A01K 97/04
U.S. Cl. 43—41.2 6 Claims



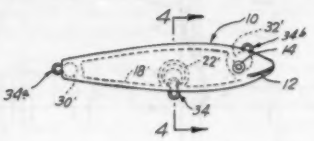
1. A fishing bobber and bait guard assembly comprising a hollow, generally cylindrical, float portion having a rounded nose and a disc closure plate, a bait container portion having a generally cylindrical wall open at both ends, said wall at a first one of said ends being mounted on said closure plate, a second one of said ends being open for insertion of the bait, said closure plate having locking lugs spaced from a surface of said plate and said container portion having a locking flange extending radially inward from said wall at said first one of said ends for positioning between said locking lugs and said surface of said plate in locking relationship.

4,060,926

FISHING LURE WITH WEIGHTED HOOK-ATTACHING SWIVEL AND METHOD OF MAKING SAME

Carl R. Cordell, Jr., P.O. Box 2020, Hot Springs, Ark. 71901

Filed May 14, 1976, Ser. No. 686,500
Int. Cl.² A01K 85/00
U.S. Cl. 43—42.44 2 Claims



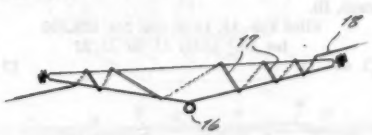
1. A fishing lure comprising a lure body formed of two complemental halves, each half being hollow and having a peripheral mating rim along which the halves are secured together, a cavity in the lower portion of said lure body having an opening leading to the exterior of the body, said cavity being formed by a pair of semi-spherical, mating walls one in each of said complemental halves and being disposed entirely within the hollow portion defined by the peripheral rim thereof, said semi-spherical walls of the cavity being joined together to form a spherical wall within the hollow halves to brace and strengthen the lure body and divide the same into two separate hollow chambers, and a ball-shaped weight rollably disposed in said cavity and secured to the upper portion of a swivel member whose lower portion loosely extends through said opening in the lure body and terminates below the lure body in an eye for swiveling attachment of a fish hook, said swivel member having the shape of a figure eight, the said upper portion being a loop completely embedded in said weight and being connected to said lower eye by a constricted bight portion loosely extending through the opening of the lure body.

4,060,927

FISH WEIGHT BLIND BINDING

William A. Haun, and Gladys M. Haun, both of 3504 Meadowlark Drive, Casper, Wyo. 82601

Filed Oct. 7, 1976, Ser. No. 730,346
Int. Cl.² A01K 95/00
U.S. Cl. 43—43.1 1 Claim



1. A fish weight blind binder, comprising, in combination, an elongated lead weight and a length of stainless steel wire, said weight being substantially triangular in transverse cross-section, said weight having a boat keel shape and having a downward eyelet at its center for snelled hooks, opposite ends of said weight tapering triangularly and each end having an eyelet, said eyelets at each end comprising a rotatable wire coil around a stationary pin, said stainless steel wire being spirally wrapped five or more turns around said weight so as to form three sharp bends upon each single turn around said weight,

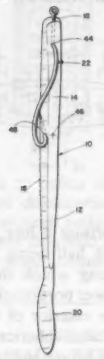
said stainless steel wire additionally selectively being insertable through said end eyelets.

4,060,928

FISH HOOK

Joseph P. Messler, 4410 E. 46th Place, Tulsa, Okla. 74135; Thomas E. Messler, 5740 S. 72nd E. Ave., and James P. Messler, 7832 S. 70th E. Ave., both of Tulsa, Okla. 74136

Filed Feb. 6, 1976, Ser. No. 655,902
Int. Cl.[2] A01K *83/00*
U.S. Cl. 43—43.16 8 Claims



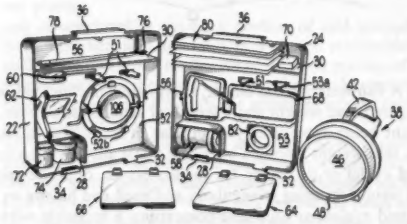
1. A fish hook comprising;
a. line attachment means at a leading end thereof;
b. a bow portion curved through approximately 180° at the opposite trailing end thereof;
c. a sharpened barbed end portion carried by the front end of the bow portion;
d. an elongated shank supported between the rear end of the bow portion and the line attachment means, the shank having a leading straight segment which is attached to the line attachment means and a remaining longer trailing segment attached to the rear end of the bow portion, the juncture between the shank leading and trailing segments comprising a compound bend made up of a rearward bend and a sidewise bend, the said trailing segment being curved into an arcuate segment with the trailing end thereof intersecting the rear end of the bow portion opposite the barbed end at an angle substantially equal to the angle of the sidewise first mentioned bend.

4,060,929

TOY DETECTIVE SET

Burton C. Meyer, Downers Grove, and Robert K. Allen, Hinsdale, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 13, 1976, Ser. No. 658,030
Int. Cl.[2] A63H *33/00, 33/22*
U.S. Cl. 46—11 17 Claims



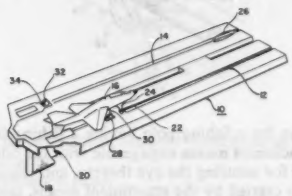
1. An amusement set, comprising: a casing having two mateable casing portions each having a top wall and a bottom wall, said casing portions mating along a peripheral seam line, hinge means for hingedly connecting said casing portions along the seam line, lockable members at each of the casing portion top walls adjacent the top wall seam line, a flashlight having a grippable handle and including lock means between the flashlight and casing for releasably locking said lockable members of said casing and releasably joining the flashlight to the casing top wall whereby the flashlight handle serves as a carrying handle for the casing and the flashlight with the casing locked.

4,060,930

TOY AIRPLANE LAUNCHER

Michael O'Hara Hirtle, Torrance, and James Edward Morse, Lawndale, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Sept. 29, 1976, Ser. No. 727,885
Int. Cl.[2] A63H *27/04*
U.S. Cl. 46—81 14 Claims



1. In a toy airplane launcher, the combination comprising:
a plurality of toy airplanes, each of said airplanes having a downwardly depending projection;
a launch platform adapted for supporting said airplanes;
resilient propoulsion means on said platform adapted for releasable engagement with each of said airplanes;
a trigger assembly movably mounted on said platform and having integral therewith a plurality of posts, each of said posts being offset from any other and being adapted for engaging said projection on said airplane to restrain the so-engaged airplane against the force of said resilient means; and
means operative on movement of said trigger assembly to displace each of said projections relative to its engaged post, the post and platform being so configured to provide individual launching of each of said airplanes with a time differential between launchings, said time differential being inversely proportional to the speed of movement of said trigger assembly.

4,060,931

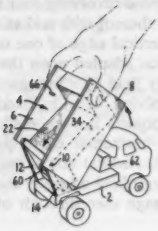
TOY DUMP TRUCK HAVING CLOSED CONTAINER OF GRANULAR MATERIAL

Philip H. Knott, One San Antonio Place, San Francisco, Calif. 94133

Filed Sept. 27, 1976, Ser. No. 727,032
Int. Cl.[2] A63H *17/06*
U.S. Cl. 46—112 18 Claims

1. A toy truck for simulating the dumping of granular material, comprising
a truck chassis and
a closed container containing granular material, said container being pivotally mounted to said truck chassis and comprising
a dumping chamber having a transparent upwardly facing wall, said dumping chamber normally extending in a generally horizontal direction,
a receiving chamber disposed below said dumping chamber and
an aperture of predetermined size connecting said dumping chamber and said receiving chamber, said aperture

being positioned to permit said granular material to pass from said dumping chamber to said receiving chamber



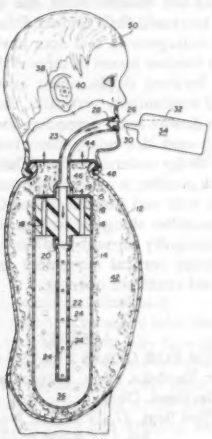
when said container is pivoted to an orientation with the forward portion thereof pointing forward and upward.

4,060,932

DOLL WITH INTERNAL WARMING MECHANISM

Armetia E. Leto, 830 Deer Park Road, Dix Hills, N.Y. 11746, and Lawrence H. Bauer, 171 W. 9th St., Deer Park, N.Y. 11729

Filed Mar. 22, 1976, Ser. No. 668,958
Int. Cl.[2] A63H *3/24*
U.S. Cl. 46—116 11 Claims



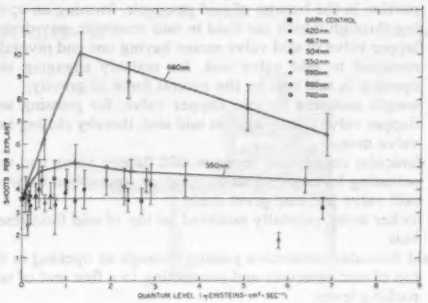
1. A doll simulating a warm-blooded mammal comprising
a head, torso and limb portions,
a non-porous heat conductive skin covering said portions,
a quantity of an exothermic salt contained within at least one of said portions, said quantity of said salt being sufficient, when wet, to produce heat to warm said skin to a temperature simulating that of a warm-blooded mammal,
and fluid communication means extending from the outside of said skin to said salt for wetting and drying said salt.

4,060,933

TISSUE CULTURE TECHNIQUE UTILIZING A SPECIFIC LIGHT SOURCE

Prakash G. Kadkade, Marlborough, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 20, 1976, Ser. No. 752,485
Int. Cl.[2] A01G *1/00*
U.S. Cl. 47—58 11 Claims



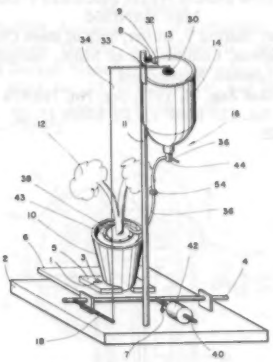
1. A method for stimulating organogenesis of explants in a tissue culture medium comprising the step of:
illuminating the explant during at least a portion of its differentiation stage with light having a predominate spectral emission at approximately 660nm.

4,060,934

WATER TENDER

Leonard L. Skaggs, 1830 Taft Highway, Signal Mountain, Tenn. 37377

Filed Sept. 27, 1976, Ser. No. 726,599
Int. Cl.[2] A01G *27/00*
U.S. Cl. 47—79 1 Claim



1. An automatic plant watering apparatus, comprising:
a support base;
a horizontal pivot shaft pivotally mounted on said support base;
a cantilever platform rigidly mounted to said pivot shaft;
a counter weight mounted to said pivot shaft opposite to said cantilever platform;
a plant container supported by said cantilever platform containing a plant to be watered, counter-balanced about said pivot shaft by said counter weight;
a fluid reservoir mounted on said support base in an elevated position with respect to said plant container;
valve means mounted on said fluid reservoir, operatively

connected to said pivot shaft, for controllably conducting fluid from said reservoir to said plant container in response to the pivotal motion which said pivot shaft undergoes when said counter weight overbalances said platform;

an actuating lever rigidly mounted to said pivot shaft on a first end, with a second end being said operative connection to said valve means;

a valve seat of said valve means having a lower threaded shank portion which engages a corresponding threaded portion in the bottom of said reservoir, forming an opening through which the fluid in said reservoir may drain;

a flapper valve of said valve means having one end pivotally mounted to said valve seat, for sealably engaging said opening in said seat by the natural force of gravity;

a weight mounted on said flapper valve, for pressing said flapper valve tightly against said seat, thereby closing said valve means;

a funicular connection between said flapper valve and said actuating lever, being said operative connection between said valve and said pivot shaft;

a rocker lever, pivotally mounted on top of said fluid reservoir;

said funicular connection passing through an opening in the top of said reservoir and connecting to a first end of said rocking lever;

a second funicular connection between a second end of said rocking lever and said second end of said actuating lever to provide an operative connection between said valve means and said pivot shaft is made;

a manifold fluid distribution block mounted in said valve means, being a circular hollow tube fastened to a circular hole in the bottom of said valve seat, having outlet ports in the side thereof through which delivery tubes may be inserted, each conducting fluid to one of a plurality of plants;

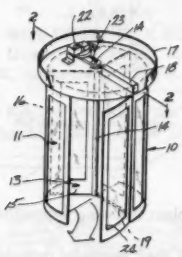
whereby a plurality of plants may be automatically watered by sensing the weight loss of water which has been evaporated and transpired from the plant in said plant container.

4,060,935

REVOLVING DOOR WITH SECURITY LOCKING MECHANISM

Larry J. Miller; Marion V. Miller, both of Reed City, and Richard E. Liebetrau, Cadillac, all of Mich., assignors to Swiss Aluminium Limited, Switzerland

Filed Jan. 24, 1977, Ser. No. 761,674
Int. Cl.² E05F *15/20*; E05D *15/02*
U.S. Cl. 49—25 **11 Claims**



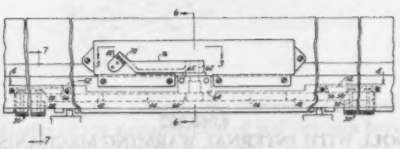
1. In a revolving door assembly comprising a generally cylindrical, vertically extending door housing, said door housing defining diametrically opposed vertically extending openings therein, a vertically mounted door comprising a central axis and at least two radially extending door leaves connected thereto, said door leaves adapted for rotation about said axis, and a canopy mounted above said door in overlapping relation to said door housing, said canopy containing means for controlling and arresting the movement of said door comprising a linearly elongated radiant energy emitting device adapted to provide a generally rectangular, planar energy field, said field of equal displacement to one of said leaves and extending in the vertical plane, said energy emitting device mounted in radial relation to the axis of said revolving door whereby said energy field abuts at one end thereof with said axis and at the opposite end thereof with a vertical edge of one of said openings, said energy emitting device adapted upon the interruption of any portion of said energy field by a foreign object to actuate the locking of said revolving door in fixed position, whereby passage of man or objects is prevented, wherein said door leaves define upper horizontal edges passing adjacent said canopy, said upper horizontal edges provided with surfaces reflective to said energy field whereby the interruption of said field during the passage therethrough of said leaves is prevented.

4,060,936

CONTAINER AND DOOR

Richard H. Jensen, Torrance, and Peter P. Parris, Tustin, both of Calif., assignors to Brooks & Perkins, Incorporated, Southfield, Mich.

Filed July 8, 1976, Ser. No. 703,616
Int. Cl.² E05C *21/02*
U.S. Cl. 49—465 **17 Claims**



1. A container having a generally rectangular opening, a door movably bodily into and out of said opening, said container having at the top of the opening upper retainer means for releasably engaging the top edge of said door and a bottom rail extending across the opening at the bottom thereof, said rail having inwardly directed spaced flanges leaving an upwardly open elongated slot therebetween, the spacing between said flanges being increased for a limited distance to define a lock-receiving slot-enlargement, said door having means for engaging said upper retainer means to support the upper edge of said door against forward displacement except when the entire door is moved substantially vertically, the bottom edge of said door having a downwardly depending lock member shaped to move through said slot-enlargement but dimensioned to be engageable with the underside of said flanges adjacent said slot when said lock member is moved longitudinally of said rail out of registration with said slot-enlargement, and means for moving said lock member along the bottom edge of said door after insertion downwardly through said slot-enlargement to retain said door against vertical movement and hence against removal from said container opening.

4,060,937

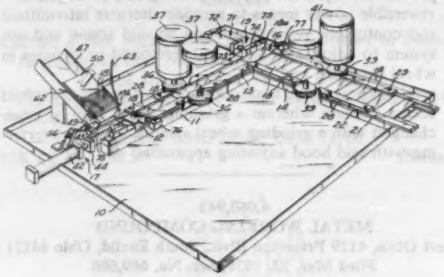
GRINDER FOR GLASS PLATES OR THE LIKE

Joseph Glazer, Eastlake, Ohio, assignor to Morse Safety Products Co., Cleveland, Ohio

Filed Sept. 27, 1976, Ser. No. 726,588
Int. Cl.² B24B *9/10*
U.S. Cl. 51—80 A **8 Claims**

1. A machine for grinding the edges of rectangular articles of glass or the like comprising first and second track means operable to respectively embrace first and second pairs of opposed edges of a row of abutting articles to support each article in said row against motion in all directions excepting along said track means and guide each piece within said row for movement along said track means, the exit end of said first track means intersecting the entrance end of said second track means at right angles, first and second pushers at the respective en-

trance ends of said track means operable with repeated cycles to engage one article and push it along said track means and thereby move the associated row along the associated track means toward the exit end thereof, said first pusher operating during each cycle to deliver a single article to the entrance end



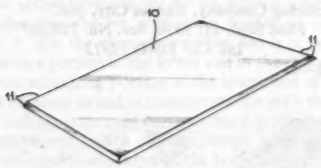
of said second track means, said second pusher operating out of phase with said first pusher to move said single article into said second track means and clear its entrance for a subsequent article, grinding means intermediate the ends of each of said track means operable to grind the opposed guided edges of articles as they move along the associated track means.

4,060,938

GLASS BEVELING MACHINE

Lee H. Barron, Sr., 4515 Alta Canyada Road, La Canada, Calif. 91011

Filed Apr. 20, 1976, Ser. No. 678,671
Int. Cl.² B24B *9/10*
U.S. Cl. 51—110 **17 Claims**



1. A glass beveling machine, comprising

bevel grinding and polishing means; a table for supporting a glass plate to be beveled in generally face-up position and with an edge of the plate oriented for operation of said grinding and polishing means on said edge;

means enabling relative movement of the grinding and polishing means and the table in a beveling pass comprising table guiding structure and means for reciprocatingly driving the table along said guiding structure;

said table comprising an array of supporting bars in a slat-like spaced relation;

limited contact glass plate supporting button-like members in spaced relation on said bars;

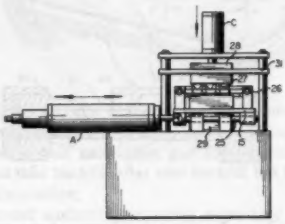
and means located along an edge of the table nearest said bevel grinding and polishing means for holding the glass plate on the table against displacement during the beveling pass.

4,060,939

DEVICE OF PLANE-PARALLEL TREATMENT OF SURFACES

Gilbert Dubied, Vilars, and Ernst Kuenzi, Corcelles, both of Switzerland, assignors to Laboratoire Suisse de Recherches Horlogeres, Switzerland

Continuation-in-part of Ser. No. 581,090, May 27, 1975, abandoned. This application June 8, 1976, Ser. No. 693,753
Claims priority, application Switzerland, June 5, 1974, 7770/74
Int. Cl.² B24B *25/00*
U.S. Cl. 51—157 **8 Claims**



1. A device for simultaneously treating two plane parallel surfaces of an article, wherein said device comprises:

one lower and one upper planar polishing blocks, the lower polishing block adapted for supporting an article to be treated,

fluid cylinder means for simultaneously subjecting an article to longitudinal and transverse movements between and in contact with said polishing blocks; and

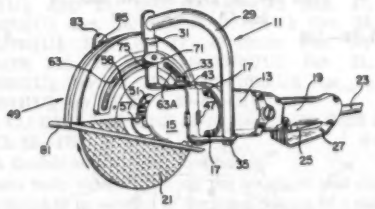
means for independently controlling the velocity and extent of each of said longitudinal and transverse movements, respectively.

4,060,940

ADJUSTABLE GUARD CONSTRUCTION FOR CUT-OFF MACHINE

Erik John DeWitt, deceased, late of Lutherville, Md., by Carol Lynn Hartsock DeWitt, administratrix, assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Jan. 13, 1976, Ser. No. 648,759
Int. Cl.² B24B *23/00*
U.S. Cl. 51—170 PT **9 Claims**



1. A circular cut-off machine comprising a housing having an electric motor therein, transmission means interconnecting said electric motor and an output spindle, an abrasive disc fixed to said output spindle, handle means for said tool including a first handle positioned rearwardly of said housing and a second handle connected to said housing so as to be positioned at the forward end portion thereof and adjacent said abrasive disc, a protective guard for said abrasive disc including a guard encompassing a portion of said disc, said guard being supported upon said housing adjacent said output spindle and adjustable about the axis of said spindle, and means associated with said second handle and releasably secured to said guard at a posi-

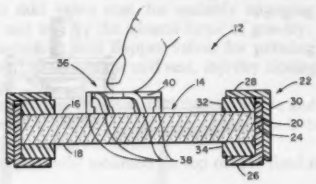
tion radially spaced from said spindle axis for rigidly securing said guard in its adjusted position to said housing through said second handle.

4,060,941

HONE FOR ROTARY ELECTRIC RAZOR CUTTERS

Arvid S. Wahlstrom, Rte. 4, Grafton, N.H. 03240

Filed June 10, 1976, Ser. No. 694,701
Int. Cl.[2] B24D *15/04, 15/10*
U.S. Cl. 51—211 H **6 Claims**



1. A manual hone for a rotary electric razor cutter with plural coplanar cutting surfaces, said hone comprising, in combination,

a stone of uniform thickness having flat parallel top and bottom surfaces, the surfaces having rounded outlines joined by a peripheral side,

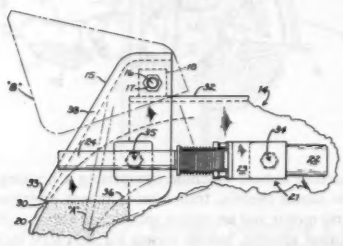
and a retainer for the stone formed of a resilient cushioning material and comprising separate inner and outer parts, the inner part having a first portion closely fitting the entire peripheral side and extending substantially beyond said outlines in directions perpendicular to said surfaces and a second portion integral with the first portion and extending in a plane normal thereto, the outer part having a third portion extending in a plane normal to the first portion and a fourth portion integral with the third portion, extending in a plane normal thereto and slidingly fitting over said first portion, the stone being supported fittingly between said second and third portions.

4,060,942

HOOD ADJUSTING APPARATUS

William Page White, and Kenneth Robert Hawkins, both of Cincinnati, Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Apr. 26, 1976, Ser. No. 680,274
Int. Cl.[2] B24B *55/04*
U.S. Cl. 51—268 **1 Claim**



1. In a grinding machine having a wheel guard enclosing a grinding wheel, and a wheelguard hood swingable about a swing axis on said wheelguard to move said hood into close proximity with a grinding wheel circumference, an improved hood adjusting apparatus comprising:

a. a first pivot joint on said wheelguard;

b. a second pivot joint on said hood, distally located from said swing axis, wherein first and second pivot joint axes are parallel to said swing axis;

c. a screw and nut system, relative rotatable, wherein said screw is axially secured to said first pivot joint and said nut is axially secured to said second pivot joint so as to provide an adjustable link connecting said pivot joints;

d. reversible power means to provide alternate intermittent and continuous relative rotation to said screw and nut system to adjust said hood to correspond to changes in wheel diameter; and

e. means to power said hood about said swing axis to a wheel access position wherein a grinding wheel may be interchanged with a grinding wheel spindle, without interfering with said hood adjusting apparatus.

4,060,943

METAL WORKING COMPOUND

Albert Olsin, 4129 Princeton Blvd., South Euclid, Ohio 44121

Filed Mar. 23, 1976, Ser. No. 669,686
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—281 R **6 Claims**

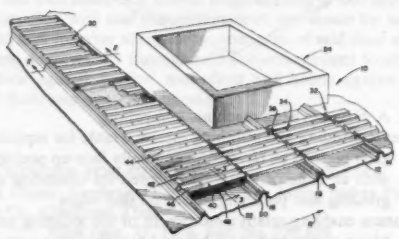
1. In a process for working a metal by contacting the metal with a working instrument and forming particles of the metal, the improvement comprising applying to at least one of said metal and instrument prior to contacting the metal with a working instrument an abrasive-free working compound consisting essentially of from 0 to about 5% by weight of a monoglyceride, from 0 to about 5% by weight of a diglyceride, and the balance substantially a triglyceride, all of said glycerides having alkyl or alkenyl moieties of from about 7 to about 17 carbon atoms, said compound being solid at room temperatures and having a melting point within the range of about 100° to about 125° F, a softening point within about 10° F of the melting point, an iodine value number no greater than about 10, and a solid fat index at 80° F within the range of about 35% to about 60%, lubricating said working of the metal by said compound which, by virtue of said properties, remains substantially at or adjacent the work area of said contact with the metal, and preventing appreciable accumulation of said metal particles on said instrument by said working compound.

4,060,944

MAINTENANCE PLATFORM FOR A BUILDING ROOF

Albert W. Sandring, Independence, Mo., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Sept. 21, 1976, Ser. No. 725,247
Int. Cl.[2] E04D *13/12*
U.S. Cl. 52—43 **18 Claims**



1. A maintenance platform for use on a building roof formed of a plurality of roof panels interconnected by seams, the maintenance platform comprising:

a maintenance platform panel seated on one of the roof panels; and

a clip securing said maintenance platform panel to a roof panel seam, said clip including an elongate tab having one end which is hooked into the seam and a U-shaped clasp having a pair of legs and a bight portion connecting said legs together, said clasp having defined therein a tab re-

ceiving slot, with the other end of said tab being received in said tab receiving slot to be hooked over one of said clasp legs to secure said clasp to the roof panel seam in a non-penetrating manner.

4,060,945

COMPOST BIN

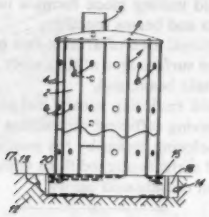
Clifford Arthur Wilson, New Hope, Pa., assignor to Rotocrop International, Ltd., Nassau, Bahamas

Filed Apr. 12, 1976, Ser. No. 676,107

Claims priority, application United Kingdom, Sept. 24, 1975, 39174/75

Int. Cl.[2] E04G *11/04;* C05F *11/06*

U.S. Cl. 52—169.5 **18 Claims**



1. An improved compost bin for decomposing vegetable matter and the like, the improved compost bin being adapted to be supported on a substrate such as the earth in which a channel having a predetermined length has been cut and comprising:

a substantially vertical bin wall including a plurality of similar panels and defining a substantially vertically disposed chamber which has an upper end and a lower end and which is used for receiving the vegetable matter and the like to be decomposed, each of the panels having a first side edge and a second side edge and being positioned, relative to the other panels, so that its first side edge is adjacent to the second side edge of one panel and so that the second side edge is adjacent to the first side edge of another panel; means for slidably interengaging the adjacent panel edges so that a panel may be selectively vertically moved, with respect to its adjacent panels, so as to permit access from outside the bin wall into the interior of the chamber; the bin wall being positioned on the substrate so that the channel underlies and is in communication with a portion of the lower end of the chamber and so that the remaining portion of the lower end of the chamber is adjacent to and in communication with the substrate on which the improved compost bin is supported, with the predetermined length of the channel being greater than the cross-sectional length of the portion of the lower end of the chamber so that air from without of the bin wall may pass through the channel and into the interior of the chamber; and a tunnel member disposed in the channel and having a perforated upwardly facing wall portion, with at least a part of the tunnel member underlying the portion of the lower end of the chamber.

4,060,946

IN-GROUND SWIMMING POOL CONSTRUCTION

Robert S. Lang, Tampa; Rodney Morris Post, Largo, and Thomas Leo Hogan, Tampa, all of Fla., assignors to L. F. Lang & Son Pools, Inc., Tampa, Fla.

Filed May 18, 1976, Ser. No. 687,537

Int. Cl.[2] E04H *3/18*

U.S. Cl. 52—169.7 **3 Claims**

1. In an in-ground swimming pool construction including a plastic swimming pool shell structure which is suspended from above in an earth excavation during construction and which rests on backfill in the final swimming pool construction, the shell having substantially rigid, preformed, plastic sides received in said excavation and spaced from the earth thereat, the improvement comprising:

a plurality of ground supported beams having means suspending said pool shell structure in said excavation from above said excavation;

a plurality of ground anchors embedded in the earth at said excavation and operatively connected to the sides of the pool shell structure in said excavation;

said ground anchors including tensioning means adjustable to pretension said shell from said beams before backfill is placed in said excavation and for tensioning said shell against said backfill after said backfill has been placed in said excavation;

said ground anchors comprising auger-type anchors each having an elongated, rod-like, rigid, central stem and a transverse anchor plate extending spirally around said stem for firmly anchoring said shell in the ground both during pre-backfill tensioning of said shell and during post-backfill tensioning of said shell.

4,060,947

FLEXIBLE NON-SKID STRIP WITH REINFORCING WEB MEMBER

Hiromitsu Naka, No. 39, Oaza Shinmachi, Yashio, Saitama, Japan

Division of Ser. No. 483,005, June 25, 1974, abandoned. This application June 1, 1976, Ser. No. 692,018

Claims priority, application Japan, July 6, 1973, 48-79785[U];July 6, 1973, 48-79786[U]; July 6, 1973, 48-79787[U]; Aug. 11, 1973, 48-94004[U]; Aug. 17, 1973, 48-96158[U]; Oct. 24, 1973,48-122792[U]; Oct. 24, 1973, 48-123793[U]; Feb. 19, 1974,49-19128; Feb. 19, 1974, 49-19129; Feb. 21, 1974, 49-20201[U]; Feb. 21, 1974, 49-20202[U]; Apr. 15, 19074, 49-41010[U]; Apr. 15, 1974, 49-41011[U]; Apr. 15, 1974, 49-41012[U]

Int. Cl.[2] B44D *5/08;* E04F *11/16;* B44C *1/26;* B32B *3/04*

U.S. Cl. 52—179 **6 Claims**

1. A flexible non-skid strip comprising:

a main body extending along the length of said strip and adapted to be secured to the tread portion of a stair;

a forward edge anchoring portion co-extending with said main body parallel to and spaced from said main body and adapted to be secured to the riser of said stair;

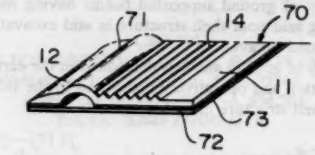
a connection portion integrally connecting the main body and anchoring portion together and adapted to bend about the stair edge of said stair so as to cover the stair edge;

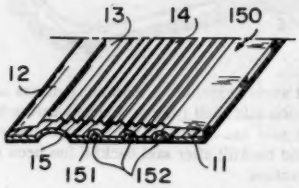
said main body, anchoring portion and connection portion being formed of a flexible synthetic resin;

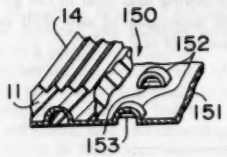
a non-skid top surface portion on the upper surface of said main body; and

a web member being formed of metal, having a plurality of holes therein, and having arcuate projections provided on and extending above the surface of the upperside thereof,

said arcuate projections, respectively bridging said holes and are embedded in said main body and anchoring portion, whereby said web member is integrally secured to the underside of the main body and anchoring portion.







4,060,948

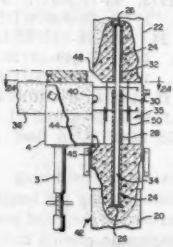
STRUCTURAL FRAME FOR A BUILDING

Robert O. Brownlee, 353 McDonald Ave., Mobile, Ala. 36604

Continuation-in-part of Ser. No. 394,771, Sept. 6, 1973. This application Aug. 23, 1976, Ser. No. 716,817

Int. Cl.² E04B *1/18*

U.S. Cl. 52—236.8 **6 Claims**



1. A structural frame constructed with preformed posts and beams connected by unitary joints formed at the construction site, said frame comprising:

upright posts disposed in superposed relation with adjacent ends thereof substantially in vertical alignment and having axial bores extending a predetermined distance into the upper and lower ends thereof;

sleeves in said bores;

a rod disposed in said sleeves and bottomed in said bores of said adjacent superposed posts and having a length sufficient to support said upper post a predetermined distance above said lower post and providing a cavity therebetween defined by the projections of the aligned walls thereof;

means removably attached to said posts for enclosing said cavity and having an aperture therein for permitting access thereto;

a uniting piece formed at the building site in said enclosing means and allowed to cure in order to form a unitary joint uniting said posts together to provide an upright column with said posts;

one or more horizontal beams having generally rectangular cross sections and having one end positioned adjacent and above the upper end of said lower post outside of said cavity and having its end surface aligned flush with the adjacent vertical side wall of said lower post; and,

wherein said uniting piece forms a unitary joint uniting said posts and beams together;

the cross-sectional area of at least one of said beams being less than the surface area of the cavity adjacent to the end surface of said beam; and,

wherein said enclosing means includes removable filler blocks having sufficient dimensions to fill the voids left in the enclosing means by the smaller beam and having their end surfaces aligned flush with the end surfaces of said beam outside said cavity.

4,060,949

DETACHABLE CONNECTOR FOR STRUCTURAL MEMBERS

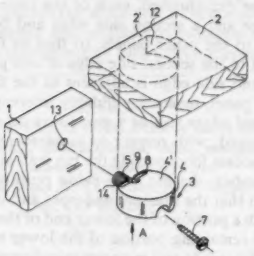
Peter Busse, Vlotho, Germany, assignor to Richard Heinze, Germany

Filed Oct. 26, 1976, Ser. No. 735,425

Claims priority, application Germany, Oct. 30, 1975, 2548527

Int. Cl.² F16B *7/04*

U.S. Cl. 52—285 **17 Claims**



1. A fastening fitting for detachable connection of two structural members especially for two structural members butting together at right angles, for example a furniture side wall with a furniture top panel, a furniture floor, a furniture intermediate floor and so on, with a holding element which can be inserted into a hole in the first structural member and with a pin which can be inserted into a hole in the second structural member as well as with an anchoring screw which engages with an opening in said pin, wherein the pin and the holding element are connected by a compressible section, which section can be compressed at least in the direction of the anchoring screw.

4,060,950

CONCEALED CLIP FOR HOLLOW STRIPS

Troy D. Rackard, and Grover E. Snider, both of Lexington, N.C., assignors to National Gypsum Company, Buffalo, N.Y.

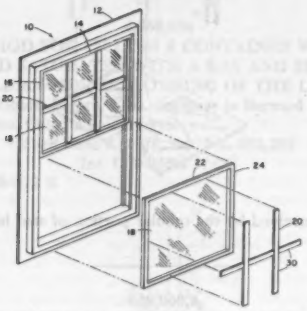
Filed Dec. 8, 1976, Ser. No. 748,653

Int. Cl.² E06B *3/30*; E04C *2/42*

U.S. Cl. 52—456 **5 Claims**

1. In combination, two intersecting hollow strips of equal cross-sectional dimensions and a concealed clip for interlock-

ing said strips, comprising two hollow strips of equal cross-sectional dimensions each having an equilateral parallelogram cutaway portion on one face, with two sides thereof extending across the full width of said strips, and two rectangular cutaway portions adjacent to said equilateral parallelogram cutaway portion located one in each side of said strip forming an equilateral parallelogram void in each strip extending through half the thickness of said strip, leaving a remaining half thickness opposite thereto, said hollow strips being interengaged with said void of each strip engaging a said remaining half thickness of the other said strip, and a semi-rigid clip disposed within said hollow strips at the intersection formed by said interengagement of said strips, said clips having a center portion and four outwardly directed legs, two oppositely directed



legs extending into two oppositely directed portions of one said hollow strip, and two other oppositely directed legs extending into two oppositely directed portions of the other hollow strip, said four outwardly directed legs being formed to urge said two hollow strips together in said interengaged relation including upwardly extending portions on two oppositely directed legs and downwardly extending portions on the two other oppositely directed legs, said upwardly extending portions having a normally upwardly extending extent and said downwardly extending portions having a normally downwardly extending extent such that when said hollow strips are placed fully together in interengaged relation said upwardly extending portions and said downwardly extending portions are still compressed and tending to urge said hollow strips tightly together.

4,060,951

STRESSLESS SUSPENSION AND ANCHORING PROCESS OF STONE VENEER

Sandor Gere, 22–48 74th St., Jackson Heights, N.Y. 11370

Filed Sept. 15, 1976, Ser. No. 723,660
Int. Cl.[2] E04B *2/88, 1/41*
U.S. Cl. 52—508 **4 Claims**

1. A stone slab mounting comprising:

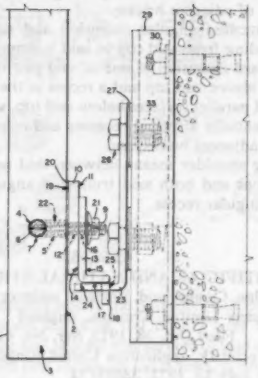
a. a stone slab having a face and an edge, a cylindrical plughole extending axially into the slab from the edge, and a bolthole perpendicular to the plughole and the face communicating with the plughole and the face;

b. a cylindrical plug having an internally threaded bore perpendicular to its axis, positioned within said plughole with the internally threaded bore of the plug in alignment with said bolthole;

c. a stud having external threads in engagement with the internally threaded bore of said plug, extending outwardly through said bolthole beyond said face of said slab;

d. a plate having a first flat surface, a second flat surface parallel to said first surface, and an internally threaded bore perpendicular to said surfaces extending from said first surface to said second surface, mounted to said stud with the internally threaded bore of said plate in engagement with the external threads of said stud, with the first surface of said plate bearing on the face of said slab;

e. a liner having a front surface and a rear surface and a through bore connecting said front surface with said rear surface, positioned on said stud with said front surface bearing on the second surface of said plate and said stud extending through said through bore, beyond the rear surface of said liner;



f. a nut in engagement with the external threads of said stud bearing on the rear surface of said liner to force said liner against said plate;

g. a filler material within said plughole and said bolthole, surrounding said plug and said stud to ensure even distribution of contact stresses; and

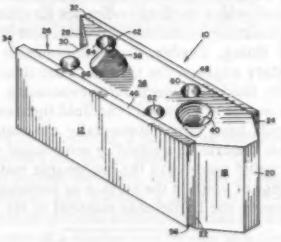
h. means for mounting said liner to a structure for transmission of loads between the slab and the structure.

4,060,952

BRICK

Gerardo Lopez Hernandez, Apartado, Postal No. 55-089, Iztapalapa, Mexico (13)

Filed May 5, 1976, Ser. No. 683,550
Int. Cl.[2] E04C *1/10*
U.S. Cl. 52—593 **1 Claim**



1. A brick having an oblong configuration, said brick comprising:

a pair of flat parallel surfaces;

a truncated angular extension on one end of said brick between said pair of flat parallel surfaces;

an angular recess on the end opposite said truncated angular extension of said brick between said pair of flat parallel surfaces, said angular recess being designed for receiving said truncated angular extension of an adjacent brick;

a top of said brick between said pair of flat parallel surfaces, a first end of said top having a generally conical extension thereabove and a second end having a generally conical recess therein;

a bottom of said brick between said pair of flat parallel surfaces, said bottom having a conical recess located immediately below said conical extension on the top of said brick and a conical extension in said bottom immediately below the conical recess in said top of said brick, said conical extensions and conical recesses being designed to fit conical extensions and recesses of adjacent bricks;

holes extending from said top of said brick to said bottom thereof, said holes being designed for alignment with holes of adjacent bricks;

said truncated angular extension and said angular recess extending from said top to said bottom of said brick

an upward extension of one of said pair of flat parallel surfaces above said top and a recess in the other of said pair of flat parallel surfaces below said top, said bottom having substantially identical recesses and extensions for mating with adjacent bricks; and

abutting shoulder means between said pair of flat parallel surfaces and both said truncated angular extension and said angular recess.

4,060,953

ARTIFICIAL AND NATURAL STRUCTURES

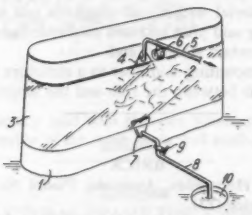
James Milne, Cumberland, England, assignor to Balfour, Beatty & Company Limited, Croydon, England

Filed Oct. 30, 1973, Ser. No. 411,038

Claims priority, application United Kingdom, Nov. 1, 1972, 50321/72; July 13, 1973, 33559/73

Int. Cl.² E02D *37/00*

U.S. Cl. 52—743 **31 Claims**



1. A method of strengthening artificial and natural structures having voids therein by introducing a hardenable material in a liquid or semi-liquid state into said voids in the structure, at least some of which voids have openings in at least one surface of the structure, which method comprises surrounding at least a part of the structure containing the voids that are to be filled by a closely fitting, flexible, fluid-impermeable shroud and sealing boundary edges of the shroud to the structure to form a substantially fluid-tight enclosure; evacuating air and any other fluid from the voids within the fluid-tight enclosure and, when the voids have been substantially evacuated, allowing the hardenable material in a liquid or semi-liquid state to enter into the evacuated voids until the hardenable material appears at said openings of voids in the surface or surfaces of the structure and allowing the hardenable material to set.

4,060,954

BAR CHAIR FOR REINFORCING RODS

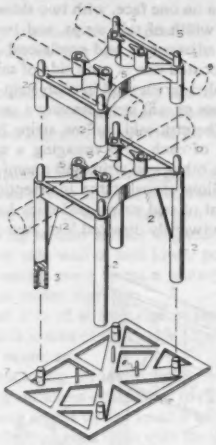
James J. Liuzza, 3522 Latma, Houston, Tex. 77025

Filed Nov. 3, 1972, Ser. No. 303,604

Int. Cl.² E04C *5/20*

U.S. Cl. 52—677 **1 Claim**

1. In a bar chair for reinforcing rods, a substantially rectangular body, having a depending cylindrical leg at each corner and opposed, upstanding cylindrical studs, the lower portion of said depending legs being tubular and the upstanding studs forming guides for the reinforcing rods to be mounted on said chair, and being of a reduced diameter adapted to fit in said tubular portion of the depending legs and extend upwardly therein for vertical support, and a detachable sand plate comprising a flat base member adapted to lie on the sand bed of a concrete slab excavation, upstanding cylindrical studs on said



base to be received by the tubular portion of said legs of the chair.

4,060,955

MACHINE FOR MECHANICAL PRODUCTION OF BRICK MASONRY

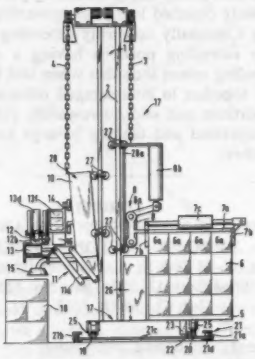
Wolfgang Lachait, Thalfingen, Germany, assignor to Adolf Berglein, Hannover, Germany

Filed July 29, 1975, Ser. No. 600,146

Claims priority, application Germany, July 11, 1975, 2530973

Int. Cl.² E04G *21/14*

U.S. Cl. 52—749 **15 Claims**



1. A machine for the mechanical production of masonry of bricks arranged in courses and in an offset manner having a carrying and guide frame adapted to move on rails along the masonry to be produced, comprising a guide frame-like carriage, on supporting rails disposed at the inside of said masonry and containing all working devices and their drives, said frame-like carriage including individual driving means for step-wise movement of said frame-like carriage on said rails and having a brick laying device at its front side and a horizontal brick storage device for stacked bricks at its rear side, and between said two devices in the center of said frame-like carriage a vertical shaft-like brick magazine, above said brick storage device a brick stack gripping and transporting device for conveying brick stacks from said brick storage device to

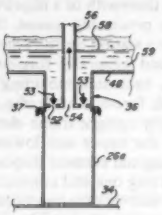
said vertical shaft-like brick magazine, the latter having a lower outlet for an individual brick and being open at its rear-side, a supply device for an individual brick from said lower outlet of said brick magazine to said brick laying device, a turning device above said brick laying device and in cooperation therewith, a lateral movement means for said brick laying device and said turning device, and vertical guide rails and lifting means at the front side for said brick laying device, said turning device and said vertical shaft-like magazine, vertical guide rails and lifting means at the rear side for said brick storage device, said brick stack gripping and transporting device, each of all mechanical working, operating, transporting and lifting devices and means having individual drives and a common overall control device for all mechanical operating devices which is also disposed on said frame-like carriage.

4,060,956

METHOD FOR FILLING A CONTAINER WITH A LIQUID SATURATED WITH A GAS AND SEALING WHILE AVOIDING FROTHING OF THE LIQUID

Ralph W. Goble, Eldora, Colo., assignor to Bernard J. Meinerz, Evergreen, Colo., a part interest

Filed June 3, 1976, Ser. No. 692,299
Int. Cl.² B65B *31/02*
U.S. Cl. 53—22 R **6 Claims**



1. A method of preventing foaming and frothing of a liquid containing a gas during the introduction into and sealing of a container therefor which comprises providing a pressure tight compartment, filling a container with a liquid containing a gas at a super atmospheric pressure sufficient to substantially prevent gas bubble nucleation at a filling station within said compartment, establishing and maintaining an ambient super atmospheric pressure in the compartment substantially as great as the gas pressure in the liquid, removing the filled container from the filling station in the presence of the ambient super atmospheric pressure in the compartment which acts to substantially prevent gas bubble nucleation in the liquid, transporting the filled container from the filling station to a sealing station while maintaining the super atmospheric pressure on the liquid contents, applying a closure to the container and sealing and closing the container while under said super atmospheric pressure.

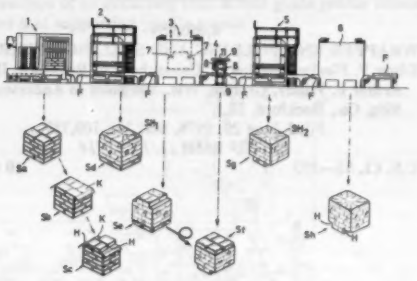
4,060,957

METHOD AND APPARATUS FOR FORMING PALLETLESS PACKAGES

Richard Birkenfeld, Beckum, and Reinhold Jaschke, Ahlen, both of Germany, assignors to Firma E. Möllers, Beckum, Germany

Filed Mar. 24, 1977, Ser. No. 780,810
Claims priority, application Germany, Apr. 3, 1976, 2614558; Jan. 22, 1977, 2702613
Int. Cl.² B65B *55/06, 35/50*
U.S. Cl. 53—26 **22 Claims**

1. A method of packaging objects in a palletless plastic foil package having cavities formed therein to receive fork arms of a lift truck, comprising the steps of stacking objects to be packaged into a plurality of layers each having the same base area and forming a stack having first and second end surfaces, placing an additional layer of objects to be packaged onto the first surface of said stack and having a base area different from the base area of said plurality of layers so that at least two recessed cavities are formed on opposite sides of said additional layer for receiving said fork arms and thus forming a completed stack, pulling a first shrink-on foil bonnet over the top of said completed stack covering said additional layer, shrinking said first bonnet onto said completed stack by application of heat, rotating said completed stack 180° so that said



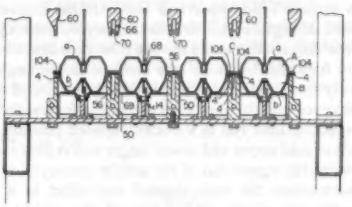
additional layer is repositioned to the bottom of said completed stack, pulling a second shrink-on foil bonnet over the completed stack covering said second end surface of said stack and overlapping with said first shrink-on foil bonnet, shrinking said second bonnet onto said completed stack and welding said first and second bonnets together at areas of overlap by the application of heat.

4,060,958

METHOD OF MANUFACTURING A PACKAGING CONTAINER

Takashi Matsui, Nara, Japan, assignor to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed June 29, 1976, Ser. No. 700,784
Claims priority, application Japan, Apr. 15, 1976, 51-43370
Int. Cl.² B65B *5/08*
U.S. Cl. 53—37 **3 Claims**



1. A method of producing a packaging container having a peelable seal which comprises steps of:

a. supplying bottom members, each made of foamed plastic sheet material and having a plurality of rectangular-shaped bottom sections series-connected at predetermined intervals, out of a stocker one by one to a conveyer;

b. placing contents in content-receiving recesses provided in said bottom sections of each of said supplied bottom member;

c. placing top members made of non-foamed plastic sheet material and having a plurality of rectangular-shaped top sections, corresponding to said plurality of rectangular-shaped bottom sections, series-connected at predetermined intervals, on said bottom members, respectively;

d. heat-sealing peripheral portions along the elongated sides of said bottom sections and top sections except for a substantially middle portion thereof with a predetermined width between adjacent assemblies of said bottom sections and top sections by abutting a heated sealing member against said peripheral portions;

e. cutting said middle portion between adjacent assemblies of said bottom section and top section by a cutting member thereby obtaining individual assemblies of said bottom and top sections; and

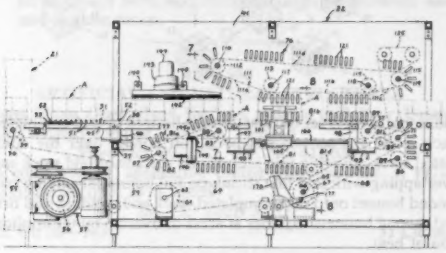
f. downwardly bending said peripheral portions along the heat-sealed elongated sides by lowering a bending member against said peripheral portions.

4,060,959

WRAPPER END FOLDING AND SEALING APPARATUS

Edgar F. Fiedler; Gordon A. Copas, both of Rockford, Ill., and Arthur F. Willey, Grafton, Wis., assignors to Anderson Bros. Mfg. Co., Rockford, Ill.

Filed June 29, 1976, Ser. No. 700,757
Int. Cl.[2] B65B *11/12, 51/14*
U.S. Cl. 53—373 10 Claims



1. An apparatus for folding and sealing upper and lower end portions of a heat sealable wrapper at the end of articles as the articles are advanced comprising:

a. an endless type article conveyor having an upper run and article pusher means at a preselected pitch distance along the article conveyor for engaging the trailing side of the articles to advance the articles and wrapper in a forward direction along a generally horizontal path of travel with upper and lower end portions of the wrapper extending laterally from the article conveyor;

b. an endless type upper and lower finger conveyors disposed alongside the article conveyor, said upper and lower finger conveyors having inlet runs that converge in said forward direction at a shallow acute angle respectively from above and below said upper run of the article conveyor and forward runs extending forwardly from the respective inlet run in vertically spaced relation, the inlet runs of said upper and lower finger conveyors converging toward the upper run of the article conveyor at locations intermediate the ends thereof and offset in a direction lengthwise of the upper run of the article conveyor whereby to effect sequential folding of the end portions of the wrapper, said upper and lower finger conveyors each having a plurality of film folding fingers extending respectively downwardly and upwardly from the upper and lower finger conveyors as they move along the inlet and forward runs thereof for engaging the upper and lower end portions of the wrapper to fold the same respectively downwardly and upwardly into overlapping relation at the ends of the article, said fingers being arranged in groups at said preselected pitch distance along the respective finger conveyor means for driving the finger conveyors in timed relation with the article conveyor with the fingers at the trailing end of each group of fingers disposed forwardly of the article pusher means on the article conveyor as the article pusher means moves along the forward run of the finger conveyors and

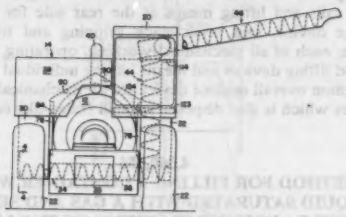
c. wrapper seal means for sealing the overlapping upper and lower end portions of the wrapper to each other as the articles are advanced by the article conveyor past said forward runs of the finger conveyors.

4,060,960

SELF-PROPELLED CROP HARVESTER

Edward John Hengen, Bettendorf, Iowa, and Mahlon Lloyd Love, Osco, Ill., assignors to Deere & Company, Moline, Ill.

Filed Apr. 22, 1976, Ser. No. 679,344
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—14.6 49 Claims



1. In a self-propelled combine adapted to advance over a field and having a plurality of wheels, an engine, an operator's station, a crop processing means and crop handling means adapted to receive crop material from the processing means, the combination therewith of a improved frame for supporting the engine, crop processing means, the crop handling means and the operator's station on the wheels and comprising:

first and second generally fore-and-aft, opposite, upright frame sides, each side including upper and lower vertically spaced, fore-and-aft frame elements, front and rear approximately upright frame elements respectively interconnecting the upper and lower frame elements and at least one diagonal element disposed between said upright elements having one end connected to an upper fore-and-aft element and its other end connected to a lower fore-and-aft element so that the frame side is in the form of a truss;

a plurality of lateral frame elements interconnecting the frame sides and including a torsion resistant tubular member rigidly connected to the frame sides at opposite connections between a diagonal and a lower element; and

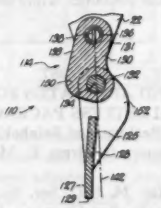
means connecting the frame sides to the wheels.

4,060,961

CROP HARVESTING ROTOR

John Dale Anderson, Canton; Richard James Buller, and Allen Thomas Trego, both of Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Feb. 23, 1976, Ser. No. 660,613
Int. Cl.[2] A01D *55/20*
U.S. Cl. 56—294 9 Claims



1. A rotor for harvesting crop material and the like, said rotor including:

a hub rotatable in one direction about a first axis;

a link pivotally mounted on said hub for swinging movement about a second axis extending generally parallel to said first axis;

an element pivotally secured to said link for swinging movement about a third axis spaced from said second axis in substantially parallel relationship to the latter,

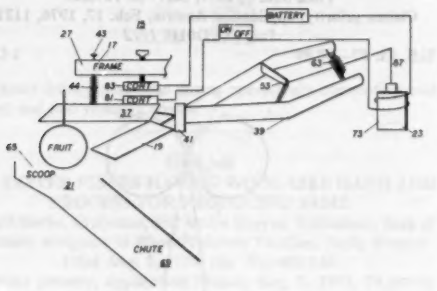
said element having an outermost end,
said second and third axes being disposed in a common plane; and
means for gravitationally positioning said outermost end such that the latter is normally spaced in trailing relationship to said common plane with respect to said direction of rotation for permitting said link and element to buckle readily in response to a radially inwardly directed force on said outermost end.

4,060,962

FRUIT CLIPPER

James T. Cooper, 528 Maple Ave., Sebring, Fla. 33870

Filed June 24, 1976, Ser. No. 699,508
Int. Cl.[2] A01D *46/24*
U.S. Cl. 56—336 7 Claims



1. A fruit cutter comprising in combination:
a. a frame assembly (17) with a front end, a travel guide (31) being defined in said front end (29), side brackets (35) on said frame;
b. a plier-like cutter (20) having blades (37) which can be opened and closed with a fulcrum (41), and rear lever members (39) held on said frame, coupling means (43) coupling said cutter (20) to said travel guide so that said fulcrum can move relative to said travel guide as said blades open and close;
c. rear spring means (63) coupled to said lever members (39) biasing said lever members so that the cutter blades (37) tend to be open;
d. solenoid means with a core and coil (75, 77) coupled to said lever members (39) which when actuated will draw the core (75) into the coil (77) drawing the lever members (39) together and closing the cutter (20);
e. a circuit including contacts, connecting said solenoid means and said cutter whereby on closing of said contacts said cutter will close, cutting a fruit stem, dropping a fruit; and,
f. a scoop and chute assembly (21) held by said side brackets (35) disposed under said cutter means (20), the fruit dropping into said scoop and chute assembly when cut.

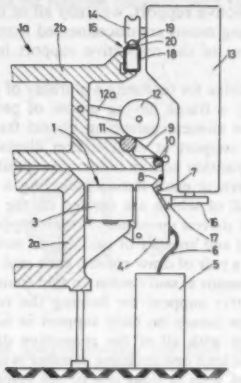
4,060,963

GUIDE TRACK ARRANGEMENT AND METHOD OF ADJUSTING THE SAME

Fritz Stahlecker, Josef-Neidhart-Str. 18, 7341 Bad Uberkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Sussen, both of Germany

Filed Apr. 12, 1976, Ser. No. 676,355
Claims priority, application Germany, Apr. 12, 1975, 2516004
Int. Cl.[2] D01H *1/16, 9/00, 16/00*
U.S. Cl. 57—1 R 48 Claims

1. A guide track arrangement for displaceably guidably mounting at least one servicing means at a spinning machine, the guide track arrangement comprising:
a supporting profile means for supporting the at least one servicing means,
a guide profile means for guiding the at least one servicing means, and
guide profile mounting means for adjustably mounting said guide profile means at said supporting profile means such that said guide profile means is adjustable at least in a direction of an occurring load at said guide profile means and said supporting profile means,



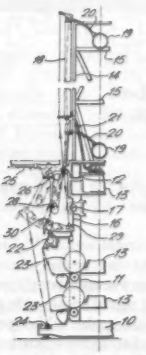
wherein said guide profile means includes a plurality of individual guide profile elements arranged side-by-side along the supporting profile means,
and wherein said guide profile mounting means includes at least one spacer means interposed between each of said guide profile sections and said supporting profile means, whereby each of said guide profile sections can be adjustably spaced with respect to said supporting profile means separately from other of said guide profile sections.

4,060,964

YARN TEXTURING MACHINE

Ronald Spencer Eaves, Chapel-en-le-Frith, England, assignor to Ernest Scragg & Sons Limited, Macclesfield, England

Filed Mar. 30, 1976, Ser. No. 672,073
Claims priority, application United Kingdom, Apr. 1, 1975, 13252/75
Int. Cl.[2] D01H *1/241, 1/28*
U.S. Cl. 57—34 HS 9 Claims



1. A machine for texturing a plurality of yarns, said machine comprising a frame having a row of processing stations; a rotatable drive shaft extending in said frame past all of said stations and carrying at each station a toothed wheel; a support

at each station displaceable between an operative position and an inoperative position; means for texturing a yarn at each station including a plurality of driven members all of which are carried on the respective support; and transmission means on each support positively interconnecting all of the respective driven members and including at least one toothed belt engaging at least some of the respective driven members, each belt being engaged with the respective toothed wheel in the operative position of the respective support and out of engagement with the respective toothed wheel in the inoperative position of the respective support, whereby all of the driven members of a texturing means are disconnected from the drive shaft on displacement of the respective support into the inoperative position.

9. A machine for texturing a plurality of yarns, said machine comprising: a frame having a row of processing stations; a single drive element extending in said frame past all of said stations; a support at each station displaceable between an operative position and an inoperative position; means for texturing a yarn at each station including a plurality of driven members all of which are carried on the respective support, one of said driven members on each supports being a pair of feed rollers and another of said driven members on each support being a pair of draw rollers, each said means for texturing including means at said station on said frame and separate from the respective support for heating the respective yarn; and transmission means on each support in intermeshing driving engagement with all of the respective driven members and including at least one coupling member in intermeshing driving engagement with at least one of the respective driven members, each coupling member being engaged with said drive element in the operative position of the respective support and out of engagement with said drive element in the inoperative position of the respective support, whereby all of the drive members of a texturing means are disconnected from the drive element on displacement of the respective support into the inoperative position.

4,060,965

METHOD AND APPARATUS TO MONITOR THREAD SPINNING OPERATION OF OPEN END SPINNING MACHINES AND EFFECTIVE THREAD STOP MOTION

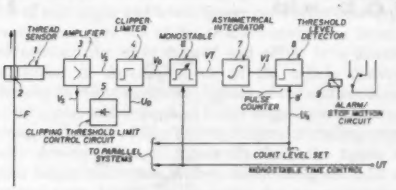
Hermann Schwartz, Pfaffikon, Switzerland, assignor to Siegfried Peyer, Bach, Switzerland

Filed Oct. 8, 1976, Ser. No. 730,745

Claims priority, application Switzerland, Oct. 10, 1975, 13187/75

Int. Cl.[2] D01H *13/22*

U.S. Cl. 57—34 R 17 Claims



1. Method to monitor the thread spinning operation of open end spinning machines having spinning turbines comprising the steps of

generating an electrical signal (V_S) representative of thread thickness and having peaks where the thread thickness deviates from an average condition;

wave shaping said signal to provide peak signal pulses upon occurrence of said peaks, which peak signal pulses will be representative of thickened portions of the thread;

applying said peak signal pulses to a triggerable blocking circuit having a predetermined blocking time when triggered by a peak signal pulse, said blocking time being shorter than the repetition time of periodically repeating peak signal pulses which are derived from irregularities in the thread, and spaced by a distance related to the circumference of the spinning turbine to obtain output pulses from the blocking circuit which recur only if the peak signal pulses repeat periodically to retrigger the blocking circuit after its blocking time has elapsed;

adding the blocking circuit output pulses

and generating a defect signal when the addition of the blocking circuit output pulses results in a sum which exceeds a pre-determined value.

4,060,966

APPARATUS FOR SPINNING TEXTILE FIBERS

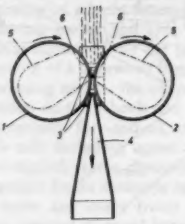
Franz Konig, Linz, Austria assignor to Dr. Ernst Fehrer Gesellschaft m. b. H. & Co., K.G. Textilmaschinenfabrik und Stahlbau, Linz, Austria

Filed Jan. 7, 1977, Ser. No. 757,589

Claims priority, application Austria, Feb. 17, 1976, 1121/76

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.89 1 Claim



1. An apparatus for spinning textile fibers, which comprises

a. two juxtaposed drums having axes extending parallel to each other and arranged to rotate in the same sense,

1. the drums being closely spaced apart to define therebetween a throat extending parallel to said axes and two like gaps tapering towards said throat at opposite sides thereof, and

2. the drums being operable to engage flying fibers entering one of the gaps at one side of the throat and to twist the fibers together in the throat to form a twisted fiber product,

b. draw-off means arranged to withdraw the twisted fiber product from the throat in the direction of the throat, and

c. a suction duct extending into the other gap at the opposite side of the throat and having an inlet slot extending along and facing the throat.

4,060,967

FALSE TWISTERS

Hellmut Lorenz, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid-Lennep, Germany

Filed Mar. 17, 1977, Ser. No. 778,500

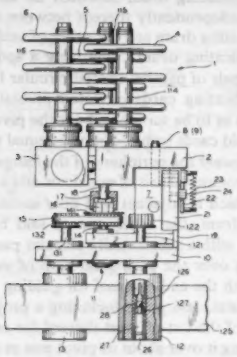
Claims priority, application Germany, Mar. 20, 1976, 2612023

Int. Cl.[2] D01H *7/92;* D02G *1/06*

U.S. Cl. 57—77.45 11 Claims

1. A false twister comprising a false twister unit including rotating means for applying a false twist to threads running therethrough, a whorl having a vertical axis of rotation, an endless drive belt adapted to drive said whorl when the latter is in tangential contact with said belt, and characterized by said whorl being rotatably journalled on a swinging member pivotally mounted on a vertical shaft and adapted to pivot about a vertical axis, thereby shifting said whorl into and out of tangential contact with said belt, said rotating means having fixed,

constant axes of rotation providing the same path for the thread running therethrough in both S-twist and Z-twist, and



rotational drive connection means operatively connecting said whorl and said rotating means.

4,060,968

POLYESTER FIBERS HAVING WOOL-LIKE HAND AND PROCESS FOR PRODUCING SAME

Gerard Barbe, Craponne, and Andre Deyres, Venissieux, both of France, assignors to Rhone-Poulenc Textiles, Paris, France

Filed Aug. 5, 1974, Ser. No. 495,124

Claims priority, application France, Aug. 3, 1973, 73.28756; June 10, 1974, 74.20255

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 9, 1976

Int. Cl.[2] D02G *3/00, 3/02*

U.S. Cl. 57—140 BY **10 Claims**

1. Crimped bicomponent polyester staple fibers having a hand similar to wool, good processability as staple fibers, a crimp contraction less than 60%, and at least 7 crimp half waves/cm, said fibers of 50 to 80% by weight of one component which comprises crosslinked polyethylene terephthalate having about 0.20 to 0.70 mole percent of crosslinking agent, based on the moles of terephthalate units, and having an intrinsic viscosity of about 0.45 to 0.60, and 50 to 20% by weight of the second component which comprises a sparingly crosslinked polybutylene terephthalate having about 0.20 to about 0.60 mole percent of cross-linking agent and having a viscosity in the molten state at 260°C. less than 4,000 poises.

4,060,969

FLYER FOR TWISTING MECHANISMS

Manuel Costales, and Moustafa I. Hakki, both of P.O. Box 884, Belmont, N.C. 28012

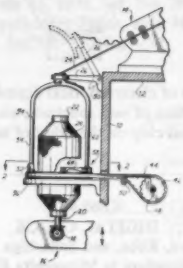
Filed June 1, 1976, Ser. No. 691,862

Int. Cl.[2] D01H *1/24, 7/24, 7/40*

U.S. Cl. 57—102 **29 Claims**

1. In a machine to twist material having
a. a frame,
b. delivery rolls on the frame,
c. a spindle mounted for rotation about its axis,
d. a bobbin on the spindle,
a flyer having legs mounted for rotation coaxially with the spindle,
f. carriage means interconnecting the flyer and spindle through the frame for causing relative axial movement between the flyer and spindle, and
g. said flyer being means for conducting the material from the delivery rolls to the bobbin,
h. the improved method of operation comprising the steps of:
j. preventing deflection of the legs of the flyer by
k. connecting them to a flange surrounding the bobbin,
m. journaling the flange to the frame by a base plate,
n. rotatably driving the flange, and thus
o. rotating the flyer.

4. In a machine to twist material having
a. a frame,
b. delivery rolls on the frame,
c. a spindle mounted for rotation about its axis,
d. a bobbin on the spindle,
e. a flyer mounted for rotation coaxially with the spindle,



f. carriage means interconnecting the flyer and spindle through the frame for causing relative axial movement between the flyer and spindle, and
g. said flyer being means for conducting the material from the delivery rolls to the bobbin,
h. the improved structure comprising in combination:
j. a flange coaxially surrounding the bobbin,
k. the flange connected to the flyer,
m. a base plate attached to the frame,
n. a main bearing on the base plate,
o. said flange journaled to the main bearing.

4,060,970

SIMULATED SPUN-LIKE BULKED YARN

James Richard Talbot, Charlotte, N.C., assignor to Fiber Industries Inc., Charlotte, N.C.

Filed Apr. 7, 1976, Ser. No. 674,350

Int. Cl.[2] D02G *3/34*

U.S. Cl. 57—140 R **11 Claims**

1. A continuous filament spun-like yarn comprising a heat set stabilized multifilament synthetic yarn wherein individual filaments are longitudinally in a helical configuration with periodic reversals of extended helix direction along their length, said individual filaments additionally having torque induced kinks and twisted loops in random distribution along the length of said yarn, said yarn being held together as an integral bundle by the intermingling of the respective individual filaments.

4,060,971

SOLID STATE WATCH WITH INERTIAL SWITCH

Arthur H. O'Connor, and Robert E. McCullough, both of Lancaster, Pa., assignors to Time Computer, Inc., Lancaster, Pa.

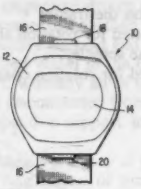
Filed Sept. 10, 1974, Ser. No. 504,734

Int. Cl.[2] G04B *19/24;* **G04C** *3/00*

U.S. Cl. 58—4 A **19 Claims**

1. A solid state wristwatch comprising a watch case, an electrically insulating frame mounted in said case, and a timing module mounted on said frame, said timing module comprising

a multi-layer electrically insulating substrate, an electrically conductive circuit on opposite outer surfaces and at least one intermediate surface of said substrate, conductive means passing through said substrate and electrically interconnecting said



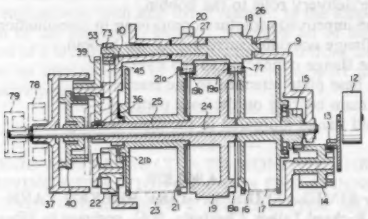
circuits, a plurality of electro-optical digital display stations on one said outer surface of said substrate, and a large scale integrated timing circuit chip on the other of said outer surfaces of said substrate.

4,060,972

DIGITAL CLOCK

Rokusaburo Kimura, Kobe, and Sadashige Horii, Shijonawate, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 8, 1976, Ser. No. 675,160
Int. Cl.² G04B *23/00*
U.S. Cl. 58—16 D **6 Claims**



1. A digital clock comprising a pair of parallel spaced base plates, a first shaft mounted between said base plates substantially at their center for rotation about its axis.

a minutes indicating drum mounted on said shaft and rotatable therewith adjacent the inside of a first one of said base plates, said minutes indicating drum comprising a spool-shaped frame having a pair of parallel spaced circular flanges, a set of five minutes indicating cards mounted pivotally between said flanges so as to be turnable about the pivot axis, the pivot axes of said cards being located at equal distances along a circle adjacent the periphery of the flange and concentric with the rotational axis of said drum, and a gear sector on that flange which is remote from said first base plate, said first base plate being provided with a substantially circular partly cut off guide extending over the peripheral path of said cards and engaged with the ends thereof for guiding said cards as the drum rotates, said guide including a projection at least at one end of the cut-off part thereof for engaging the card and turning it over about its pivot axis as said drum rotates,

a drive motor mounted on the outside of said first base plate, reducing gear means coupling said motor with said first shaft and also with said minutes indicating drum for rotating said shaft and said minutes indicating drum intermittently at the passage of each minute,

a tens of minutes drum mounted on said first shaft for rotation independently thereof and which includes six faces each with a different ten-minute numeral thereon, said tens of minutes drum having a ring gear thereon at the side adjacent said minutes indicating drum and a gear section at the opposite side thereof,

an hours indicating drum mounted on said first shaft for rotation independently thereof between said tens of minutes indicating drum and the other of said base plates, said hours indicating drum comprising a spool-shaped frame having a pair of parallel spaced circular flanges, a set of 6 hours indicating cards mounted pivotally between said flanges so as to be turnable about the pivot axis, the pivot axes of said cards being located at equal distances along a circle adjacent the periphery of the flanges and concentric with the rotational axis of said drum and a ring gear on that flange which is adjacent said gear sector on said tens of minutes drum, the other one of said base plates being provided with a substantially circular partly cut off guide extending over the peripheral path of said cards and engaged with the ends thereof for guiding said cards as the drum rotates, said guide including a projection at least at one end of the cut-off part thereof for engaging the card and turning it over about its pivot axis as said drum rotates

a second shaft parallel to said first shaft and which is supported between said base plates for rotation about its axis, a first pinion rotatable with said second shaft and which is meshed with the gear sector on said minutes indicating drum and also with said ring gear on said tens of minutes drum for transmitting the intermittent rotation of said minutes indicating drum each ten minutes to said tens of minutes indicating drum to drive the latter, a second pinion rotatable on said second shaft and which is meshed with said gear sector on said tens of minutes indicating drum and also with said ring gear on said hours indicating drum for transmitting the intermittent rotation of said tens of minutes indicating drum each hour to said hours indicating drum to drive the latter, and

a snoozing mechanism comprising a set time indexing wheel rotatable with the elapse of time and which shifts axially when the set time is reached, an actuating member for closing a pair of electrical contacts in response to a shifting of said indexing wheel, and a locking means for temporarily locking said contacts in their open state again after said closing thereof, said tens of minutes drum including a hollow shaft by which it is mounted on said first shaft, an end of said hollow shaft being extended through said other base plate so as to transmit its rotary motion to said indexing wheel, and an end of said second shaft also being extended through said other base plate so as to transmit its rotary motion to said locking means for releasing the locking of said contacts.

4,060,973

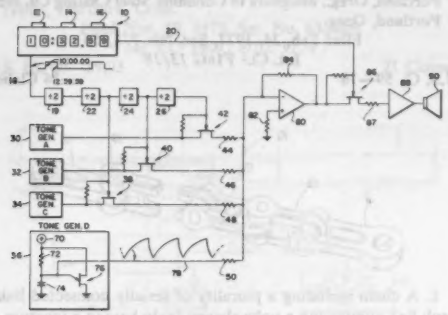
AUTOMATIC VARIABLE-SOUND ALARM CLOCK

Dom Martino, 1 Emmalon Circle, White Plains, N.Y. 10602

Filed Apr. 2, 1976, Ser. No. 673,092
Int. Cl.² G04C *21/16*
U.S. Cl. 58—19 R **7 Claims**

1. An alarm clock comprising display means for displaying the time of day, means for representing a time of day when an alarm is to be sounded, means for generating an alarm sound when the time of day displayed on said display means corresponds to the time of day represented by said representing means, said alarm sound generating means including means for generating at least two predetermined alarm sounds having different tone contents, and means for automatically changing

the alarm sound which is generated by said alarm sound generating means at periodic intervals to control the generation of



different predetermined alarm sounds when an alarm is first sounded on different days.

4,060,974

METHOD AND APPARATUS FOR DRIVING ELECTROCHROMIC DISPLAY DEVICE

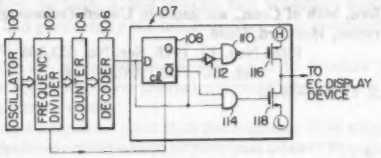
Minoru Natori, Tokyo; Toshikazu Hatuse, Tanashi; Kouhei Kawanobe, Kawagoe; Hiroshi Ogawa, Tokorozawa; Fukuo Sekiya, Tokorozawa; Heihachiro Ebihara, Tokorozawa, and Misao Uchino, Tokorozawa, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed July 1, 1976, Ser. No. 701,971

Claims priority, application Japan, July 2, 1975, 50-81581; July 31, 1975, 50-92550; Aug. 12, 1975, 50-97934

Int. Cl.² G04C *3/00*

U.S. Cl. 58—23 R **2 Claims**



1. In an electronic timepiece having a power source, an oscillator circuit, a frequency divider coupled to the oscillator circuit, counter means coupled to an output of the frequency divider to generate clock pulse information signals, decoder means for converting the time information signals into display information signals, and an electrochromic display device having a plurality of display elements, the improvement comprising:

a latch circuit, having data and clock input terminals and Q and $\overline{Q}$ output terminals, said data input terminal is coupled to an output of said decoder means and said clock input terminal coupled to the frequency divider to receive a clock pulse therefrom, said latch circuit for storing display information signals delivered from the decoder means and generating output signals delayed for a time interval from the display information signals;

a NAND gate, having two inputs, one input coupled through an inverter to the output of said decoder means, for generating a first output pulse, in response to a falling edge of each display information signal having a pulse width;

an AND gate, having two inputs, one input coupled to said $\overline{Q}$ output of the latch circuit and the other input coupled to the output of said decoder means, for generating a second output pulse, in response to a rising edge of each display information signal having a pulse width;

a P-channel MOSFET responsive to the first output pulse to cause the flow of electric current through said display element in a bleaching direction; and

an N-channel MOSFET responsive to the second output pulse to cause the flow of electric current through said display element in a coloring direction.

4,060,975

METHOD AND APPARATUS FOR DRIVING ELECTROCHROMIC DISPLAY DEVICE

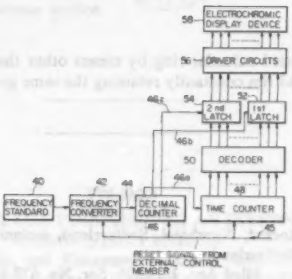
Sizuo Yamaguchi, Sayama, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed July 13, 1976, Ser. No. 704,795

Claims priority, application Japan, July 14, 1975, 50-85986

Int. Cl.² G04B *19/34*

U.S. Cl. 58—50 R **10 Claims**



1. In an electronic timepiece having a frequency standard for providing a higher frequency signal, a frequency converter to divide the higher frequency signal down to a lower frequency signal, a time counter coupled to the frequency converter to provide time information signals in response to the lower frequency signal, a decoder coupled to the time counter for generating decoded signals in dependence on the time information signals, and an electrochromic display device having display elements for displaying the decoded signals, the combination comprising:

signal generation means coupled between the frequency converter and the time counter to generate frst, second and third phase signals in response to the lower frequency signal;

means for presetting the count value in the time counter to cuase said time counter to provide a count value signal prior to a time represented by said count value signal;

a first latch circuit coupled to the decoder and responsive to said second phase signal and said decoded signals to generate a bleaching signal for bleaching the display elements at a first timing;

a second latch circuit coupled to the decoder and responsive to said third phase signal and said decoded signals to generate a coloration signal for coloring the display elements at a second timing.

4,060,976

CALENDAR RING DRIVING WHEEL FOR TIMEPIECES

Edwin Jakob, Grenchen, Switzerland, assignor to ETA A.G. Ebauches-Fabrik, Switzerland

Filed May 10, 1976, Ser. No. 685,130

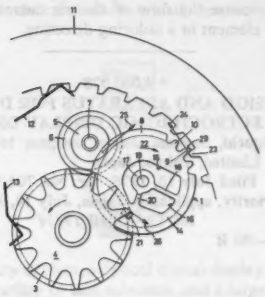
Claims priority, application Switzerland, May 16, 1975, 6345/75

Int. Cl.² G04B *19/24, 27/00*

U.S. Cl. 58—58 **7 Claims**

1. A driving wheel for advancing a toothed calendar ring of a timepiece, comprising a hub and a toothed rim having a driving tooth projecting radially beyond said rim for engaging the toothing of said calendar ring, further comprising means for connecting said hub to said rim in such a way that said rim and said hub are concentric upon advancement of said calendar

ring by said driving tooth and that said rim together with said driving tooth is displaced relative to said hub upon advancement of said calendar ring by means other than said driving tooth, said rim constantly retaining the same geometric shape.



4,060,977

TIMEPIECE

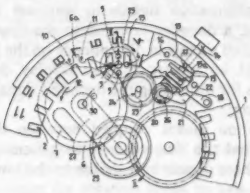
Daniel Rochat, Neuchatel, Switzerland, assignor to Ebauches S.A., Switzerland

Filed Apr. 22, 1976, Ser. No. 679,473

Claims priority, application Switzerland, May 1, 1975, 5611/75

Int. Cl.² G04B 27/08

U.S. Cl. 58—85.5 **14 Claims**



1. In a timepiece having a control mechanism including a rotatable control stem with several axial positions, at each of which it effects a different operation, a calendar mechanism including a crown-ring indicator having circumferentially spaced radial slots, a driving disc having a pair of diametrically opposed drive pins spaced from each other a distance corresponding to the distance separating the openings to said slots, a driving member rotatably driven at the rate of one revolution per 24 hour period and having means for driving said driving disc step-by-step at the rate of one step per 24 hour period, said driving disc and crown-ring indicator being disposed such that said drive pins cooperate with said radial slots so that during each step of said driving disc one of said pins drives said crown-ring indicator through one step while traveling into and out of one of said slots, said drive pins during each successive rest position of said driving disc being disposed in locking engagement within the openings to two of said slots, an improved correcting mechanism for setting said crown-ring indicator comprising means for connecting said control stem and driving disc when said control stem is in one of its axial positions, and means for mounting said driving member for movement to an inoperative position with respect to said driving disc for releasing said driving disc with respect thereto so that said driving disc can be operated by said correcting mechanism.

4,060,978

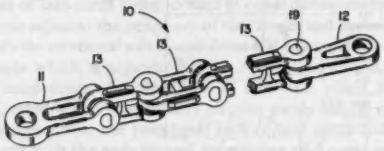
DRAG CHAIN

Robert T. McBain, Brush Prairie, Wash., and Bruce C. Johnson, Portland, Oreg., assignors to Columbia Steel Casting Co. Inc., Portland, Oreg.

Filed Feb. 24, 1977, Ser. No. 771,555

Int. Cl.² F16G 13/18

U.S. Cl. 59—78 **14 Claims**



1. A chain including a plurality of serially connected links, each link comprising a yoke shaped body having a juncture at one end defining an open area, a pair of spaced apart lugs at the other end forming an open end, each lug having a pin eye, the pin eyes being aligned with one another and each including a flat surface oriented toward said other end of the link, and a link pin shaped complementarily to the pin eyes, with a flat surface from end to end on one side and of a length to extend into both pin eyes, with a pin keeper affixed to the flat surface of the pin between the lugs when the pin is assembled in the eyes to prevent escape of the pin, said main links being interconnected with the pin of each link passing through said juncture end open area of the next succeeding link.

4,060,979

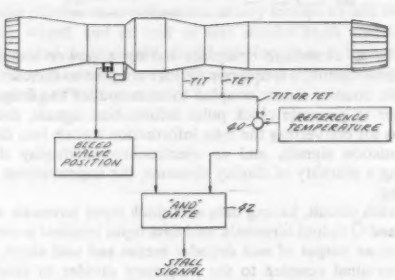
STALL WARNING DETECTOR FOR GAS TURBINE ENGINE

Fred L. Elsaesser, Glastonbury, and Joseph H. Hall, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 19, 1975, Ser. No. 633,308

Int. Cl.² F02C 9/02, 9/14

U.S. Cl. 60—39.03 **6 Claims**



4. The method of detecting stall in flow gas turbine engine that includes a compressor, turbine and burner and compressor bleed valves comprising the steps of:

measuring the temperature in proximity to the turbine so as to produce an output signal whenever this temperature is excessive in relation to normal engine operation,

measuring the position of the compressor bleed valves so as to produce an output signal whenever the compressor bleed valves are opened,

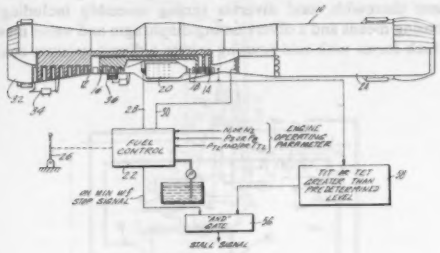
combining the outputs obtained in the steps of measuring so as to produce a signal indicative of stall solely when both output signals are present which signal can then be used as a warning or to initiate corrective action.

4,060,980

STALL DETECTOR FOR A GAS TURBINE ENGINE

Fred L. Elsaesser, Glastonbury, and Joseph H. Hall, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 19, 1975, Ser. No. 633,309
Int. Cl.[2] F02C 9/02, 9/14
U.S. Cl. 60—39.03 21 Claims



1. Stall detector for a gas turbine engine having a compressor, burner and turbine, in combination with a fuel control having a fuel metering valve regulating the flow of fuel to the burner and independent coordinating means providing a schedule for the minimum fuel flow metered by said fuel metering valve, said stall detector including means responsive to said minimum fuel flow schedule for producing a first signal whenever said fuel control is on the minimum fuel flow schedule, means responsive to another operating parameter for producing a second signal when said parameter reaches an abnormal condition of engine operation and means responsive to both said first signal and said second signal for producing a third signal indicative of stall solely when said first signal and said second signal are received.

14. The method of detecting stall in a gas turbine axial flow engine which includes a fuel control that schedules engine operation and particularly the minimum fuel flow comprising the steps of:

measuring the fuel control schedule so as to produce an output signal whenever the fuel metered to the engine is at the minimum value,

measuring a parameter other than the minimum flow schedule which parameter would be abnormal relative to engine operation when the fuel control is on the minimum flow schedule to produce an output signal when that parameter is abnormal under those circumstances,

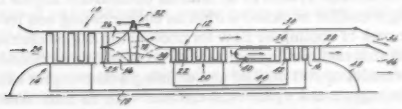
combining both the output signals obtained in the steps of measuring to produce an output signal solely when both signals are present to indicate a stall condition which signal can be used as a warning or to initiate stall corrective action.

4,060,981

DIVERTER VALVE FOR COANNULAR FLOWS

Thomas L. Hampton, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed June 1, 1976, Ser. No. 691,314
Int. Cl.[2] F02K 3/02
U.S. Cl. 60—226 R 12 Claims



1. A valve for controlling the fluid flow between axially separated upstream and downstream sections of generally coannular inner and outer ducts, comprising:

a pair of flow mixers, one associated with each coannular duct section and each terminating in a set of flow chutes numbering n in amount extending substantially across and around the section annulus, alternating chutes being in fluid communciation with the inner and outer ducts of their respective sections, and wherein the chutes of each section open toward each other and are fixedly indexed circumferentially with respect to each other by $360°/2n$,

a stage of radially extending vanes numbering $2n$ in amount, disposed between the mutually facing sets of chutes, said vanes pivotable about their longitudinal axes; and

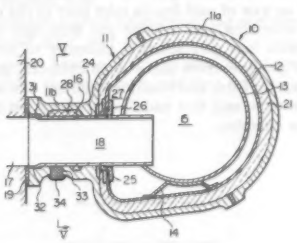
means for actuating said vanes to selectively turn the flow exiting the chutes associated with at least one of said upstream chutes by no more than half a chute width into the chutes associated with either the inner or outer duct of the downstream section.

4,060,982

EXHAUST GAS PURIFIER FOR AN INTERNAL COMBUSTION ENGINE

Masami Konishi, and Kazumasa Futamura, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 24, 1976, Ser. No. 670,009
Claims priority, application Japan, Dec. 17, 1975, 50-149472
Int. Cl.[2] F01N 3/10
U.S. Cl. 60—282 4 Claims



1. An exhaust gas purifier for an internal combustion engine, comprising:

a housing;

a chamber in said housing for burning unburned gas in the exhaust gas from the engine;

an inlet port liner in said housing, said inlet port liner forming an exhaust gas passage which communicates said chamber and the exhaust gas outlet opening of the cylinder head of the engine for leading the exhaust gas from the engine cylinder into said chamber, and;

an outlet port for leading the exhaust gas in said chamber to the atmosphere;

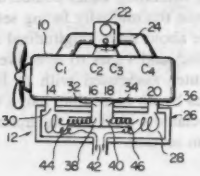
wherein the outer end of the inlet port liner is press-fitted into a portion of the inner wall of the housing adjacent one end thereof and there is an annular gap between the liner and the housing and said housing has at least one through-hole for pouring melted weld metal towards the outer peripheral surface of the inlet port liner from the outside of the housing and a weld metal is disposed in said through-hole for rigidly connecting the inlet port liner with the housing.

4,060,983

EXHAUST GAS REBURNING DEVICE

Kenji Masaki, Yokohama, and Hatuo Nagaisi, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 12, 1975, Ser. No. 603,916
Claims priority, application Japan, Aug. 13, 1974, 49-92642
Int. Cl.[2] F01N 3/10
U.S. Cl. 60—282 3 Claims



1. An exhaust gas reburning device for an internal combustion engine, comprising a reaction chamber having first, second, third and fourth inlet ports each opening into said reaction chamber to admit exhaust gas of said engine thereinto,

said second and third inlet ports being interposed between said first and fourth inlet ports and adjoining each other, first and second cylinders each located in said reaction chamber, said first cylinder being connected at one end to said second inlet port and extending at the other end toward an extension of an axis of said first inlet port in the direction of which extension said exhaust gas from said first inlet port flows into said reaction chamber to strike against exhaust gas flow from said first cylinder, said second cylinder being connected at one end to said third inlet port and extending at the other end toward an extension of an axis of said fourth inlet port in the direction of which extension said exhaust gas from said fourth inlet port flows into said reaction chamber to strike against exhaust gas flow from said second cylinder, and an outlet port opening from said reaction chamber at a nearly equal distance from said first and fourth inlet ports outside said reaction chamber.

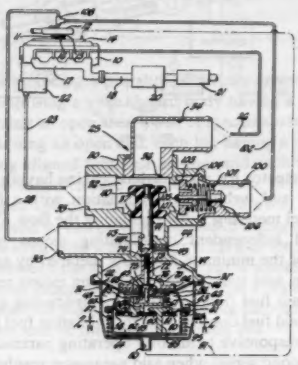
4,060,984

AIR SWITCHING DIVERTER VALVE

Gordon R. Paddock, Rochester, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 22, 1976, Ser. No. 734,977
Int. Cl.[2] F01N 3/10
U.S. Cl. 60—290 4 Claims

1. An air switching diverter valve for use with an internal combustion engine to control the flow of secondary air from an air pump to either the exhaust manifold of the engine or, to some other element associated with the engine or with the exhaust system for the engine, said air switching diverter valve including a valve housing having an inlet connectable to the air pump, a first outlet connectable to the exhaust manifold, a second outlet and a pressure valve controlled third outlet for the discharge of air above a predetermined pressure, a valve member mounted in said valve housing for movement between a first position blocking flow through said first outlet and a second position blocking flow through said second outlet, a vacuum actuated switching diaphragm assembly positioned in said valve housing and connected to said valve member and operative to effect movement of said valve member between said first position and said second position, said switching diaphragm forming with said valve housing a pressure chamber on one side thereof in communication via orifice passage means with the atmosphere and, on its other side, a vacuum chamber that is connectable to the induction system of the engine so as to be supplied with engine vacuum, a diverter timing assembly movably positioned in said vacuum chamber and attached at one end to said switching diaphragm for movement therewith, said diverter timing assembly including a housing means and a divert timing diaphragm and valve means which forms with said housing means a divert vacuum chamber that is in direct communication with said vacuum chamber and a timing chamber on opposite sides of said divert timing diaphragm and valve means, said switching diaphragm having a passage means therethrough whereby to effect communication between said pressure chamber and said divert vacuum chamber, a control valve being positioned to control flow through said passage means with one end of said control valve extending into said divert vacuum chamber in position to be engaged by said divert timing diaphragm and valve means, said divert timing diaphragm and valve means being operative to effect opening of said control valve during rapid engine decelerations.



4,060,985

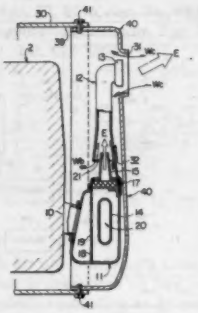
EXHAUST SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Tsugio Fukushima, Nagahama, Japan, assignor to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed Mar. 11, 1976, Ser. No. 666,000
Claims priority, application Japan, Mar. 13, 1975, 50-34493[U]
Int. Cl.[2] F01N 5/04
U.S. Cl. 60—319 2 Claims

1. An exhaust system of an internal combustion engine comprising a muffler enclosed within an engine casing and located in the path of cooling air flow for cooling the engine characterized in that said muffler is provided with an ejector connected to the outlet of said muffler and defining a convergent exhaust gas passage, and a cylindrical diffuser with its inlet arranged concentric overlapping relation to the outlet of said ejector so that an annular cooling air passage having a cross-sectional

area and an axial lapping length suitable for introducing desired volume of cooling air thereinto and with its outlet arranged with respect to an exhaust opening of the engine casing



such that the mixture of the exhaust gas and the cooling air issuing from the outlet of the diffuser is further surrounded with cooling air flow, said muffler and diffuser being arranged crosswise to the general direction of the cooling air flow.

4,060,986

Patent Not Issued For This Number

4,060,987

TURBINE DRIVE SYSTEM

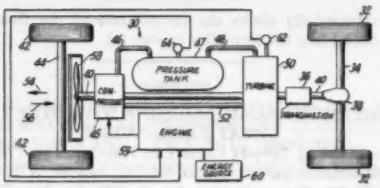
Shlomo Chaim Fisch, 264 Penn St., and Ichak Fisch, 266 Hooper St., both of Brooklyn, N.Y. 11211

Continuation-in-part of Ser. No. 581,819, May 29, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 761,417

Int. Cl.[2] F15B *11/06, 11/18*

U.S. Cl. 60—409 **9 Claims**

1. A system for operating a vehicle, comprising:
   a. vehicle drive means for propelling the vehicle;
   b. compression means operative by said vehicle drive means for supplying a fluid under pressure;
   c. storage means for receiving and storing the fluid under pressure;
   d. turbine means having a vane rotor responsive to the fluid under pressure from said storage means for operating said vehicle drive means;
   e. a return flow path from said turbine means to said compression means for returning the fluid to said compression means;
   f. said vehicle drive means including a common drive shaft coupled to drive wheels of the vehicle, said compression means and said turbine means being coupled to said drive shaft;
   g. said turbine means including a support structure defining an enclosure space, said drive shaft extending through said enclosure space and being mounted on the support structure, said enclosure space being divided into a first section and a second section substantially isolated from each other;
   h. a first rotary turbine of a predetermined small radius mounted within said first section on a first portion of said drive shaft, said first turbine being rotatable within said first section;
   i. a second rotary turbine of a predetermined large radius substantially larger than said predetermined small radius being mounted within said second section on a second portion of said drive shaft, said second turbine being rotatable within said second section;
   j. said first and second turbines respectively being adapted for driving said common drive shaft and for working in series flow relationship with said fluid under pressure;



   k. said support structure defining a first inlet through which said fluid under pressure can enter and drive said first rotary turbine, said support structure further defining a first outlet from said first section and a second inlet to said second section; and
   l. a spiral conduit section interconnecting said first outlet and said second inlet, and said support structure defining a second outlet from said second section, whereby residual energy from the fluid from said first section is utilized in said second section.

4,060,988

PROCESS FOR HEATING A FLUID IN A GEOTHERMAL FORMATION

George B. Arnold, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

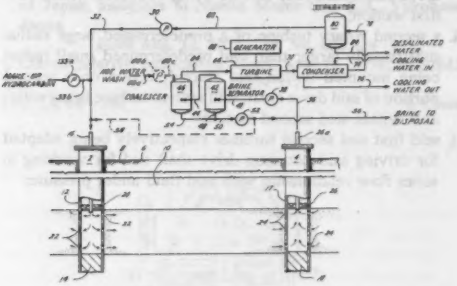
Filed Apr. 21, 1975, Ser. No. 570,157

Int. Cl.[2] F03G *7/00*

U.S. Cl. 60—641 **26 Claims**

1. A method of heating a fluid in a brine-containing geothermal reservoir formation penetrated by an injection well and a production well which comprises:
   a. introducing an organic fluid having a low solubility in water into the formation through the said injection well,
   b. forcing the said organic fluid through the said formation thereby heating the said fluid,
   c. recovering the said heated organic fluid substantially free

of brine through the said production well and wherein the temperature of the said geothermal reservoir formation is



substantially above the temperature of the fluid introduced into the formation in step (a).

4,060,989

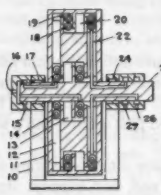
THERMODYNAMIC MACHINE WITH STEP TYPE HEAT EXCHANGERS

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 600,312, July 30, 1975, Pat. No. 3,986,361. This application Apr. 9, 1976, Ser. No. 675,304

Int. Cl.[2] F02C *1/04*

U.S. Cl. 60—650 **6 Claims**



1. In a thermodynamic machine, wherein a working fluid is compressed and expanded in a cycle, with the compression being provided within an outwardly extending rotor passage, (and) the expansion is provided within an inwardly extending rotor passage, the outward ends of said passages being connected by a first passage means and the inward ends of said passages being connected by a second passage means to form a continuous fluid circulation loop, (and wherein a hot heat exchanger is provided to exchange heat with the working fluid downstream of the compression within said outward extending rotor passages,), said fluid circulation loop being provided with a heat addition heat exchanger and a heat removal heat exchanger, the improvement comprising:

a. providing said (a step type hot) heat addition heat exchanger (to exchange heat with said working fluid downstream of said compression) with heat addition steps comprising outwardly and inwardly extending passages and heat exchange means to add heat into said working fluid simultaneously with work exchange by said fluid with the rotor.

4,060,990

POWER GENERATION SYSTEM

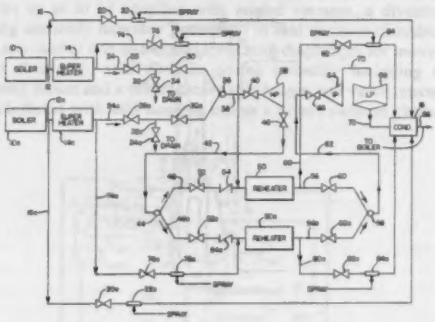
Paul Vincent Guido, Cedar Grove; Robert Lenox Criswell, Florham Park, and Albert John Zipay, Clifton, all of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Feb. 19, 1976, Ser. No. 659,300

Int. Cl.[2] F01K *13/00*

U.S. Cl. 60—676 **13 Claims**

1. A power generating system comprising vapor generating means, a turbine having a relatively high pressure section and at least one relatively low pressure section, first fluid transfer means connecting said vapor generating means to said high pressure turbine section, a condenser, second fluid transfer means connecting said turbine to said condenser, third fluid



transfer means for connecting said vapor generating means directly to said condenser, at least two reheaters connected in parallel, and fourth fluid transfer means connecting each reheater between said high pressure turbine section and said low pressure turbine section.

4,060,991

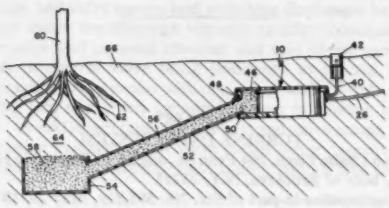
SUB-SURFACE IRRIGATION METHOD AND APPARATUS

Olen Dennis Reese, 4508 Third, La Mesa, Calif. 92041

Filed Oct. 20, 1976, Ser. No. 734,299

Int. Cl.[2] E02B *13/02*

U.S. Cl. 61—13 **13 Claims**



1. A sub-surface moisture distribution and control system for controlling the supply of moisture to the roots of plants comprising:

a moisture control unit, said unit comprising a vessel submerged beneath the surface of the earth, said vessel having a float chamber and a water reservoir surrounding and communicating with the float chamber;

an inlet to said float chamber for connecting to a source of water;

valve means responsive to the level of water in said float chamber for controlling the communication of water to said vessel;

air vent means for venting said float chamber to atmosphere for preventing vapor lock of said unit; and

moisture conducting means for conducting moisture from said water reservoir to plant roots remotely spaced laterally from said moisture control unit;

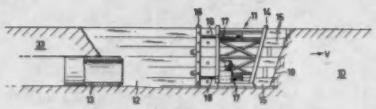
said moisture conducing means comprises a body of porous material having a higher porousity than the surrounding earth formation and disposed in conduit means having at lest impervious bottom and side walls, and one portion of said conducting means in intimate communication with water flowing from said float valve chamber and extending to a moisture pit adjacent to the roots of aplant for conveying moisture thereto.

4,060,992

METHOD OF AND APPARATUS FOR LAYING A PIPE-LINE

Herbert Heitkamp, Lutkeheide, and Heinz Hüsemann, Grevinghof, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Altluenen, Germany

Filed Apr. 30, 1976, Ser. No. 682,065
Claims priority, application Germany, Apr. 30, 1975, 2519210
Int. Cl.[2] E02D 5/02
U.S. Cl. 61—41 A 11 Claims



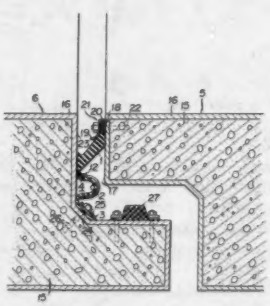
1. In an apparatus for use in driving a trench and for installing a pipe-line which is composed of pipe sections arranged end-to-end, said apparatus including an advanceable shield for excavating an open trench for receiving the individual pipe sections, the shield having a front frame which guides and supports a plurality of elongated members which themselves support the walls of the trench, the shield having a rear frame which is selectively locked to individual elongated members, ram means acting between the two frames for moving the rear frame relative to the front frame to cause selected elongated members to be moved forward lengthwise of the trench, the improvement therein comprising: thrust means for urging the forward-most pipe section rearwardly into telescopic engagement with the pipe-line, said thrust means coupled to and extending rearwardly from said rear frame, said thrust means including at least one thrust member selectively movable between a working position in lengthwise alignment with and abutment against the forward rim of the forward-most pipe section, and a storage position out of lengthwise alignment with and removed from abutment against the forward rim of the forward-most pipe section.

4,060,993

WATER SEAL PACKING FOR SEALING WATER AT THE COUPLING PORTION OF UNDERWATER STRUCTURES

Soichiro Shimizu, Tokyo, Japan, assignor to Tokyo Fabric Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1976, Ser. No. 749,896
Claims priority, application Japan, Mar. 8, 1976, 51-26449[U]
Int. Cl.[2] E02D 25/00; F16L 49/00
U.S. Cl. 61—43 3 Claims



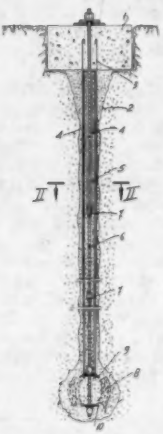
1. A water seal packing for sealing water at the coupling portion of under water structures comprising first and second structures, each being disposed oppositely at the end thereof; said water seal packing comprising an intermediate body portion having a sliding surface at one end thereof, said intermediate body portion being disposed for inclination relative to the underwater structures and being bendable at a base end thereof; a first flange portion formed integrally with said intermediate body portion at the base end thereof, said first flange portion being fixedly secured to said first under water structure; a flexible U-shaped portion formed integrally with said intermediate body portion at the other end thereof adjacent to the sliding surface, said U-shaped portion having a plurality of wave-shaped sections or ridges formed thereon in a space apart relationship; and a second flange portion formed integrally with said U-shaped portion on the side opposite to said intermediate body portion, said second flange portion being fixedly secured to said second underwater structure wherein the sliding surface of said intermediate body portion is adapted to slide freely on the surface of said second structure.

4,060,994

PROCESS FOR PROVIDING A FOUNDATION PILE FOR ALTERNATING COMPRESSIVE AND TRACTIVE STRESSES AND A PILE THUS PROVIDED

Wolf Chitis, Naples, Italy, assignor to Fondedile S.p.A., Naples, Italy

Filed Nov. 5, 1976, Ser. No. 739,084
Claims priority, application Italy, Nov. 11, 1975, 40427/75
Int. Cl.[2] E02D 5/44
U.S. Cl. 61—53.6 6 Claims



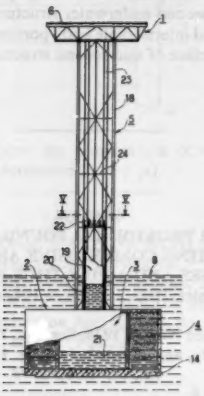
1. A process for providing a foundation pile for alternating compressive and tractive stresses, comprising the steps of forming a bore in the ground, inserting in said bore an assembly of reinforcement bars, the lower end of which has secured thereto a chamber comprising two nearly flat discs vertically spaced apart from each other by a substantial distance, a perforated generally cylindrical and rupturable side wall extending between said discs and externally thereof an impervious coating, said assembly including at least two tubes extending into said chamber, casting concrete about said assembly and allowing it to set, whereupon injecting grout through at least one of said tubes into said chamber at such a pressure that the side walls of the chamber will break and the grout will expand laterally into the ground, then after a determined period, scavenging the chamber and then repeating said injections and scavenging until the volume taken up by the injections is minimized.

4,060,995

IMMERSION OF AN OFFSHORE WEIGHT-STRUCTURE HAVING TWO COMPARTMENTS

Roger Lacroix, Paris Cedex, and Claude Lepere, Boulogne-sur-Seine, both of France, assignors to Sea Tank Co. S.A., Rungis Cede, France

Filed Mar. 22, 1976, Ser. No. 669,458
Claims priority, application France, Mar. 26, 1975, 75.09509
Int. Cl.[2] E02B 17/00
U.S. Cl. 61—92 10 Claims



1. A method of immersing an offshore structure which includes a self-resistant base, a multitubular pylon fixed to the base and having guiding bars extending lengthwise thereof a working area installed on the pylon, an auxiliary hollow float mounted on the pylon and jack means for releasably clamping the float to the guiding bars for varying the relative positions of the base and the float, and wherein the base comprises a central multicellular compartment and a peripheral multicellular compartment the interior of which is adapted to communicte with the surrounding water as well as with a source of pressure fluid compensating for the pressure of the surrounding water, the method comprising:

a. initiating immersion of the base by partially filling the central compartment with liquid; and

b. thereafter continuing immersion of the base by admitting additional liquid into the central compartment, lowering the base relative to the float by clamping the float to the guiding bars and pumping liquid from the central compartment into the float, the pumping permitting the load on the jack means to be restricted at a substantially constant draft whereby the jack means is usable to great depths.

4,060,996

VUILLEUMIER CYCLE THERMAL COMPRESSOR AIR CONDITIONER SYSTEM

Charles M. Hanson, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

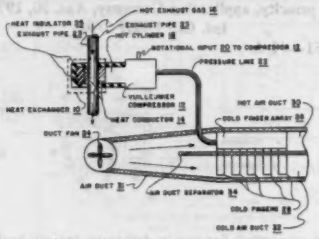
Filed Dec. 16, 1976, Ser. No. 751,295
Int. Cl.[2] F25B 9/00
U.S. Cl. 62—6 4 Claims

1. A Vuilleumier cycle thermal compressor air conditioner system comprising:

a hot exhaust heat source and heat exchanger in intimate contact with the hot volume of a Vuilleumier compressor hot cylinder,

a rotational input device connected to a crankshaft in a crankcase volume that is on the opposite side of a regenerator matrix displacer from said hot volume, wherein a displacer rod is connected between said displacer and an outer point on said crankshaft to impart reciprocal motion to said regenerator matrix displacer and produce alternate high and low pressure waves corresponding to alternate hot and cold temperatures in said crankcase volume; and

a cold finger array comprised of a plurality of free-displacer regenerator matrix refrigerators that are in communication with and are driven by said alternate high and low



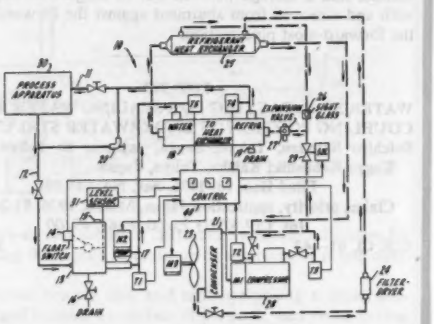
pressure waves, said refrigerators having a cold volume end position in a cold air duct and an ambient volume that is in direct communication with said pressure waves and a pneumatic volume positioned in a hot air duct wherein a duct fan vents air through said hot and cold air ducts to selectively air condition an enclosed space.

4,060,997

WATER CHILLER CONTROL

Gilbert F. Shultz, Novi, and Ronald W. Bailey, Westland, both of Mich., assignors to Application Engineering Corporation, Elk Grove Village, Ill.

Filed Mar. 31, 1976, Ser. No. 672,255
Int. Cl.[2] F25D 17/02
U.S. Cl. 62—180 16 Claims



1. In a water chiller comprising:

a principal heat exchanger having first and second separate fluid paths extending therethrough in heat-exchanging relationship;

pump means for circulating process fluid through a process fluid path including, in series, a process apparatus and the first heat exchanger path;

and compressor means for circulating a refrigerant fluid through a refrigerant path including, in series, a condenser and the second heat exchanger path;

a control system comprising:

a process fluid pressure sensor, connected to the process fluid path, for developing an electrical process fluid pressure signal having an amplitude indicative of the pressure at a given point in the process fluid path;

a process fluid pressure reference circuit for developing a reference signal of preset amplitude representative of a predetermined pressure;

process fluid pressure comparator means for comparing the process fluid pressure signal and the reference signal to develop a process fluid pressure cut-off signal indicative of a deviation of the process fluid pressure in a given sense from the predetermined pressure;

and control circuit means, coupled to the process fluid pressure comparator means and to the pump means, for deactivating the pump means in response to the process fluid pressure cut-off signal.

4,060,998

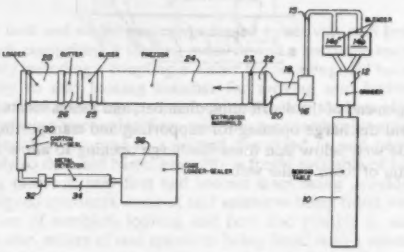
PORTION CONTROLLED FROZEN FOOD

Vincent E. Bernard, Richardson, Tex., assignor to The Jimmy Dean Meat Company, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 526,146, Nov. 22, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,481

Int. Cl.² F25C *5/02*

U.S. Cl. 62—320 **11 Claims**



1. A system for forming a plurality of discrete products having preselected volumes and weights comprising:

means for receiving a quantity of semi-fluid material,

a pump for pumping said material at a selected rate,

an extruder associated with said pump and having an inlet to receive said pumped material and having an outlet for outputting said pumped material,

conduits connected to said outlet for conveying a continuous uniform thickness sheet of said material,

a chilling station located at the remote end of said conduit for receiving said continuous sheet of said material and for chilling said continuous sheet to an extent that said sheet maintains its extruded cross-section,

a plurality of equally spaced parallel rotatable cutting disks located at the outlet of said chilling station for continuously slicing said chilled sheet into continuous lengths and means for periodically severing the continuous lengths to form a plurality of products having the preselected volume and weight, said means for severing including an elongated cutting blade disposed above and normal or said continuous lengths, and

means for moving said blade downwardly for simultaneously severing all of said continuous lengths while moving said blade in the direction of travel of said continuous lengths and at the same speed of travel of said continuous lengths.

3. A system for forming a plurality of discrete products having preselected weights comprising:

a hopper for receiving a quantity of warm semi-fluid material,

a feed line,

a pump for pumping said material through said feed line at a selected rate and pressure,

an extruder manifold having an inlet connected at the end of said feed line and including an outlet with a smaller dimension than said inlet,

a flexible conduit extending from said manifold outlet and including an end nozzle to form a continuous extruded sheet of material,

a metering pump mounted in series with said flexible conduit to meter the flow of said material therethrough,

a chilling chamber mounted adjacent said end nozzle,

a conveyor for receiving said continuous sheet from said end nozzle and for carrying said continuous sheet through said chilling chamber to chill and firm said continuous sheet,

a plurality of rotatable slicing disks, each said disk having a cutting edge along the circumference thereof and mounted at the outlet of said chilling chamber for slicing said continuous sheet into parallel continuous lengths of equal widths, and

a cutting blade mounted downstream of said slicing disks and movable in synchronism with said conveyor for severing said continuous lengths to form a plurality of discrete products having the selected weight.

4,060,999

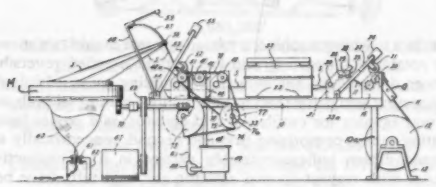
METHOD AND APPARATUS FOR FORMING YARN ELEMENTS AND PRODUCING PRODUCTS THEREFROM

Ronald H. Marks; Paul D. Marks, and Lawrence R. Goodman, all of Dallas, Tex., assignors to Enterprise Incorporated, Dallas, Tex.

Filed Nov. 5, 1974, Ser. No. 521,037

Int. Cl.² D04B *3/06, 15/48, 27/10, 35/00*

U.S. Cl. 66—125 A **11 Claims**



1. An apparatus for forming yarn elements including,

a supply roll of thermoplastic web material which is a relatively thin film and which is easily distorted when unequal pulling forces are applied to the web in a direction longitudinally of the web,

a set of rotatable holding rollers engageable with the web material,

at least one of said holding rollers being located beneath the web material and another of said holding rollers being located above the web material with both of the rollers extending completely across the web material and applying equal holding force to said web material throughout its entire transverse width,

a set of rotatable pulling rollers,

a cutter assembly between the holding rollers and the pulling rollers,

means for conducting the web material to said holding rollers,

means for directing said web material through the cutter assembly to cut the web into strips,

a heater forming a heating zone located between the cutter assembly and the pulling rollers, whereby the strips pass through said heater to soften the same,

means forming part of the heater for preventing the edges of the strips from fusing to each other as they pass through the heating zone, and

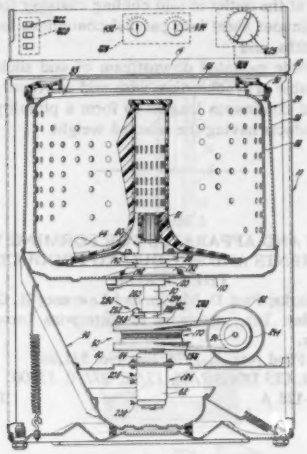
means for operating the holding rollers at a slower rotative speed than the pulling rollers, whereby said pulling rollers pull the web material through the cutter assembly and heater and simultaneously exert a pulling force upon the softened strips to elongate the strips and reduce their width.

4,061,000

BELT DRIVE ARRANGEMENT FOR AGITATOR WASHER MECHANISM

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 21, 1976, Ser. No. 697,942
Int. Cl.[2] D06F *13/02*
U.S. Cl. 68—23.7 5 Claims



1. In a washing machine, a tub, an agitator in said tub, means for rotatably supporting said tub, a double-ended reversible power drive shaft, and power transmitting means drivingly connecting said drive shaft to said tub for rotating said tub and to said agitator for oscillating said agitator, said power transmitting means comprising first and second concentrically arranged driven pulleys rotatably carried in fixed respective planes with respect to said agitator and said tub, drive belt means encircling said driven pulleys and opposite ends of said drive shaft, clutch means for drivingly rotating said agitator relative to either of said driven pulleys, said clutch means being selectively operable to effect a driving relationship first between said drive shaft and one of said driven pulleys and then between said drive shaft and the other of said driven pulleys when said drive shaft is operating through said belt means to rotate said driven pulleys in opposite directions, and means for actuating said clutch means in a continuously repetitive pulsating manner to effect the back and forth oscillation of said agitator in said tub.

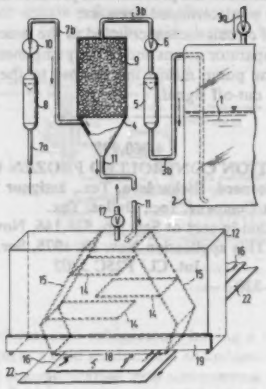
4,061,001

DEVICE FOR THE APPLICATION OF FOAM ON TEXTILE WEBS

Hans-Ulrich von der Eltz, Frankfurt am Main; Erich Feess, Hofheim, Taunus, and Siegfried Glander, Bad Soden, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 21, 1976, Ser. No. 688,896
Claims priority, application Germany, May 24, 1975, 2523062
Int. Cl.[2] D06B *1/08*
U.S. Cl. 68—200 5 Claims

5. A device for the application of a liquid treating bath in the form of a foam onto flat textile materials comprising, a liquid storage vessel, mixing chamber means communicating with said storage vessel to receive liquid therefrom, means for forming foam from said liquid in said mixing chamber, a foam distributing chamber associated with said mixing chamber for receiving foam therefrom and including an open lower end, a doctor blade mounted on said distributing chamber along said lower end thereof, a plurality of laterally staggered vertically spaced overlapping baffle plates mounted in said distributing chamber above said lower end for receiving foam from the mixing chamber and distributing the foam within the distributing chamber; means in said distributing chamber for defining a variably dimensioned foam discharge opening at said lower



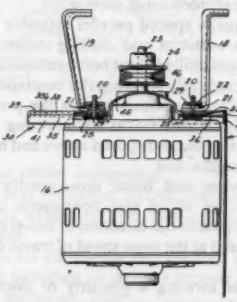
open end of the distributing chamber; and means located below said discharge opening for supporting and transporting a textile web below said foam discharge opening to allow application of foam to the web.

4,061,002

MOTOR SHIELD FOR APPLIANCE

Reinhold Alvin Drews, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 25, 1976, Ser. No. 670,119
Int. Cl.[2] D06F *37/00*
U.S. Cl. 68—212 11 Claims



1. In an appliance having an electric motor and a liquid receptacle mounted generally above said motor, protection means for substantially preventing liquid from said receptacle from contacting said motor, said protection means comprising:

a shield mounted above said motor between said motor and said receptacle, said shield including raised perimeter portions for preventing liquid collected on said shield from contacting said motor, and

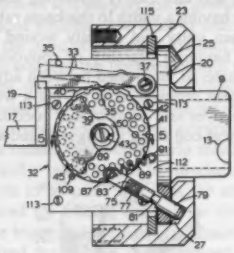
a flexible drape mounted on one side of said shield and extending downwardly adjacent a side of said motor.

4,061,003

KEY OPERATED LOCK

Aksel Pilvet, R.R. No. 2, Warsaw, Ontario, Canada

Filed Dec. 8, 1976, Ser. No. 748,482
Int. Cl.[2] E05B *21/00*
U.S. Cl. 70—352 2 Claims



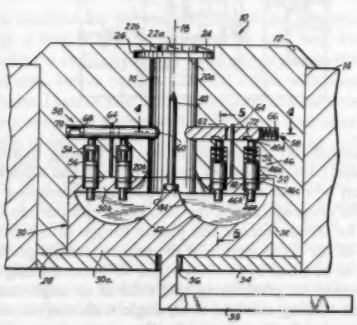
1. A lock and coded key card adapted to activate said lock, said lock comprising a locking member and a rotatable barrel assembly including a coupling member for coupling said barrel assembly to said locking member for moving said locking member from a locking to an unlocking position, said coupling member being uncoupled from said locking member by a first disc rotatably mounted to a second disc fixed to said barrel assembly so that said barrel assembly is freely rotatable of said locking member, said first and second discs being provided with aligned apertures, some of said apertures being fitted with a first set of tumblers locking said first disc relative to said second disc, others of said apertures being fitted with a second set of tumblers mounted in a release position, and being located in the path of the key card so that they are moved to a locking position to prevent movement of said first disc and to prevent coupling of said coupling member to said locking member when a key card bearing an incorrect code is inserted in said lock, said coded key card being adapted to engage both sets of tumblers such that said first set of tumblers are moved from the locking position and said second set of tumblers remain in a release position to release said first disc from said second disc, said first disc being tensioned to move relative to said second disc upon release of said first set of tumblers and being adapted to couple said coupling member to said locking member so that said locking member is moved from a locking position to an unlocking position.

4,061,004

PICK-PROOF LOCK CYLINDER AND KEY THEREFOR

George Pappanikolaou, 621 90th St., Brooklyn, N.Y. 11228

Filed Dec. 1, 1976, Ser. No. 740,212
Int. Cl.[2] E05B *19/12, 27/03*
U.S. Cl. 70—363 30 Claims



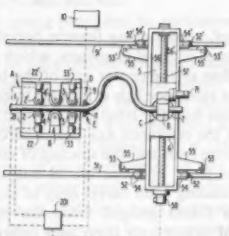
1. A lock cylinder for use with a jointed key generally defining an axis and having at least one pivotally mounted coded finger which is movable between an initial position substantially parallel to said axis and a final position substantially normal to said axis, said lock cylinder comprising an external housing having two coaxial cylindrical cavities in communication with each other, one of said cylindrical cavities defining a keyhole for the jointed key and having an opening to the exterior of said external housing at one end and a remote end proximate to the other of said two cavities, said keyhole having a diameter generally smaller than that of said other cavity; a revolving cylinder disposed beyond said remote end of said keyhole and having a diameter generally corresponding to that of said other cavity and mounted only for free coaxial rotation therein; means mounted on said revolving cylinder for common rotation therewith and adapted to cooperate with an associated lock mechanism, said revolving cylinder being provided with at least one cam surface generally facing said one of said cavities and having a surface portion proximate thereto whereby insertion of the jointed key into said lock cylinder causes said finger to initially abut against said cam surface portion, said cam surface being configured to move said finger from said initial position to said final position upon full insertion of the jointed key into said lock cylinder; and decoding means spaced from the axis of said cavities and cooperating with said external housing and said revolving cylinder for normally preventing said revolving cylinder from rotating relative to said external housing and permitting the same to rotate only when said decoding means detects an appropriate code on said finger in said final position of said finger.

4,061,005

METHOD AND APPARATUS FOR CONTINUOUS BENDING OF ELONGATED MATERIALS

Shunpei Kawanami, Hiratsuka, and Yukimitsu Hanamoto, Yokohama, both of Japan, assignors to Daiichi Koshuha Kogyo Kabushiki Kaisha, Japan

Filed Dec. 9, 1975, Ser. No. 639,195
Claims priority, application Japan, Sept. 18, 1975, 50-113468
Int. Cl.[2] B21D *7/12, 7/16, 9/00*
U.S. Cl. 72—30 20 Claims



1. A method for bending elongated materials comprising the steps of:

guiding the elongated material to permit movement of the elongated material in a direction generally parallel to the principal axis of an unbent portion of the material;

clamping a portion of the material;

applying a bending force to the material by rotating a clamped portion of said material on an axis of rotation intersecting the clamped portion of the material, said axis being maintained substantially perpendicular to a plane and being freely displaceable;

heating a portion of the material intermediate the guided portion and the clamped portion of the material;

monitoring the reaction force on the material due to the application of the bending force; and

rotating the clamped portion of said material and selecting the perpendicular distance of the displaceable axis of rotation from the extended principal axis of the unbent

portion of the material in response to the monitored reaction force and a predetermined bending program.

8. An apparatus for bending elongated materials comprising:

guiding means for engaging elongated material moving relative thereto;

bending means associated with said guiding means for clamping a portion of the elongated material and for applying a bending force to the elongated material by rotating the clamped portion of the material on an axis of rotation, said axis being displaceable while being maintained substantially perpendicular to a plane including:

a frame moveable along a plane substantially parallel to the principal axis of an unbent portion of the elongated material engaged by said guiding means;

a slide member supported by said frame and moveable relative to said frame along an axis substantially perpendicular to the principal axis of the unbent portion of the elongated material engaged by said guiding means; and,

a clamping device for engaging the elongated material, supported by said slide member and driven to rotate with respect to said member; and,

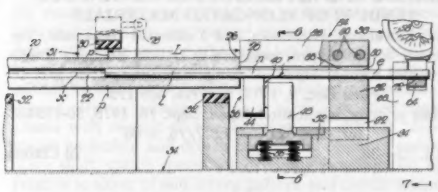
heating means for heating a portion of the material said heating means being located intermediate the guiding means and the clamping device.

4,061,006

METHOD OF STRAIGHTENING FIREARM BARRELS

Arthur H. Burns, Jr., Hamden, Conn., assignor to The Marlin Firearms Company, North Haven, Conn.

Filed July 29, 1976, Ser. No. 709,778
Int. Cl.² B21D *3/16*
U.S. Cl. 72—34 **9 Claims**



1. Method of straightening firearm barrels of equal lengths with drilled bores of equal diameters, which comprises measuring the deviation of the center axis of the bore of each barrel from a straight reference axis at a single transverse barrel plane spaced less than half the length of the barrel from one barrel end, of which the reference axis passes through the centers of the opposite bore ends and the spacing of said transverse plane of each barrel from said one barrel end is the same for all barrels, and bending each barrel only at said transverse plane thereof to an extent gauged from the measured deviation thereat of said center axis from said reference axis and in a direction to bring said center axis at said barrel plane substantially into line with said reference axis.

4,061,007

ELECTROMAGNETIC DENT REMOVER WITH ELECTROMAGNETIC LOCALIZED WORK COIL

Karl A. Hansen, and I. Glen Hendrickson, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

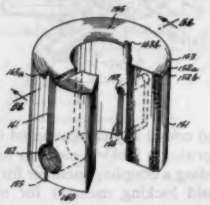
Continuation-in-part of Ser. No. 489,290, July 17, 1974, Pat. No. 3,998,081. This application Jan. 2, 1976, Ser. No. 646,068
Int. Cl.² B21D *26/02*
U.S. Cl. 72—56 **35 Claims**

1. Apparatus for electromagnetically removing dents from conductive materials comprising:

a first current source for supplying a first current pulse of predetermined polarity and rise time;

a second current source for supplying a second current pulse having a polarity opposite to that of said first current pulse, said second current source including means for establishing the magnitude of said second current pulse at a predetermined magnitude relative to the magnitude of said first current pulse and means for establishing a rise time of shorter duration than said rise time of said first current pulse;

a dent removal head including an electrical coil formed of a conductive strip and electrically insulating material, said conductive strip having a width to thickness ratio substantially greater than unity and spirally wound to form a cylindrical coil having a plurality of convolutions with said insulating material interposed between adjacent convolutions, said dent removal head having a working surface positionable over said dents of said conductive material, said cylindrical coil being configured and arranged to



define a predetermined stressing region within said working surface of said dent removal head, said predetermined stressing region supplying localized electromagnetic flux when electrical current flows through said convolutions, said localized electromagnetic flux being higher in intensity than the electromagnetic flux formed within regions of said working surface outside of said stressing region; and

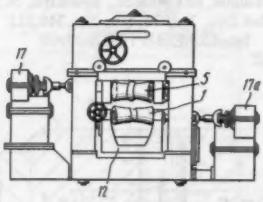
control means connecting said coil to said first and second current sources for supplying said first and second current pulses to said electrical coil, said control means including means for supplying said second current pulse at a time when said first current pulse attains a predetermined magnitude.

4,061,008

ROLLS OF A SKEWED-ROLL MACHINE FOR TRUEING CYLINDRICAL METAL ARTICLES

Jury Lukich Semenenko, ulitsa Gogolya, 1, kv. 30, Dnepropetrovsk, U.S.S.R.

Filed Nov. 10, 1976, Ser. No. 740,735
Int. Cl.² B21D *3/04*
U.S. Cl. 72—98 **2 Claims**



1. A skewed-roll trueing machine for trueing cylindrical metal articles having a narrow central portion and a thickened end portion wherein the plastic torque of the bending resistance of the cross-section of the thickened end portion of the article to be trued exceeds the plastic torque of the bending resistance of the cross-section of the narrow central portion of the article to be trued by not more than 10%, comprising a pair of rolls, means for positioning said rolls at an angle with respect to the trueing axis and at an angle with respect to each other and means for spacing said rolls apart corresponding to the diameter of the article to be trued, said pair of rolls comprising a support roll in the form of a body of rotation with a

biconcave profile wherein the portions of said support roll adjoining the ends thereof have a hyperboloidal concave surface for engaging the narrow central portion of the article to be trued, and the central portion of said support roll has a hyperboloidal concave surface for bending the thickened end portion of said article to be trued, wherein the curvature of said central portion of said support roll is greater than the curvature of the portions adjoining the ends of said support roll, a pressure roll in the form of a body of rotation with a convexo-concave profile wherein the portions of said pressure roll adjoining the ends thereof have a hyperboloidal concave surface with a curvature for engaging the thickened end portion of the article to be trued, and the central portion of said pressure roll comprises a radially projecting strip means having a curvilinear profile and a radial height for producing a bending torque on the article to be trued less than the maximum permissible value required for trueing the narrow central portion of the article to be trued and not less than the minimum permissible value required for trueing the thickened end portion of the article to be trued.

4,061,009

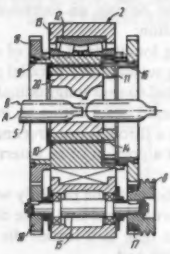
MACHINE FOR SPINNING TUBULAR WORKPIECES

Vladimir Georgievich Kaporovich, ulitsa Lenina, 2, kv. 106; Viktor Grigorievich Sereda, ulitsa Jubileinaya, 11, kv. 127; Vitaly Kirillovich Udovenko, ulitsa Parkovaya, 35, kv. 105; Nadezhda Nikolaevna Zelenskaya, ulitsa Shkadinova, 58, kv. 75; Viktor Yakovlevich Brazhnik, ulitsa Pionerskaya, 5, kv. 34, all of Kramatorsk; Evgeny Pavlovich Sviridov, ulitsa Orlovskaya, 6, kv. 80, and Jury Nikolaevich Fabrichev, ulitsa Volodarskogo, 54, kv. 44, both of Bryansk, all of U.S.S.R.

Filed Nov. 10, 1976, Ser. No. 740,736

Int. Cl.² B21D *41/04*

U.S. Cl. 72—69 **8 Claims**



1. A machine for the spinning of tubular workpieces, comprising: a bed; a spindle mounted on said bed, said spindle comprising a main sleeve and an auxiliary sleeve, the bore axis of said main sleeve being somewhat offset with respect to the longitudinal axis of said main sleeve, said auxiliary sleeve being turnably mounted within said main sleeve and coaxially with the bore of said main sleeve, means for rotating said auxiliary sleeve and said main sleeve wherein said auxiliary sleeve is rotated at a speed slightly different from that of the main sleeve; a forming tool means for spinning a heated tubular workpiece, said forming tool means rigidly fixed within said auxiliary sleeve; clamping device means for clamping the tubular workpiece, means for stationary mounting of said clamping device means on said bed ahead of and coaxially with said spindle on the side of said spindle which receives the tubular workpiece; a feeding means for feeding the tubular workpiece into said spindle, said feeding means rigidly affixed on said bed ahead of said clamping device means.

4,061,010

APPARATUS FOR COOLING THE ROLLS OF ROLLING MILLS

Thomas Adrian Cheetham Stock; Patrick Daniel Dougan, and Olivo Guiseppe Sivilotti, all of Kingston, Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

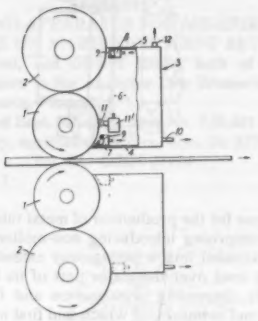
Division of Ser. No. 585,460, June 10, 1975, Pat. No. 3,994,151.

This application Sept. 16, 1976, Ser. No. 723,966

Claims priority, application United Kingdom, June 11, 1974, 25942/74

Int. Cl.² B21B *27/10*

U.S. Cl. 72—201 **7 Claims**



1. A rolling mill for metal reduction comprising

a. upper and lower work rolls defining a roll bite through which the metal is passed, for reduction, from an ingoing side to an outgoing side of the mill,

b. at least one back-up roll in contact with said upper work roll along a line of contact,

c. means for applying liquid coolant to the outer surface of said upper work roll at a locality on only the outgoing side of the mill above said roll bite,

d. a containment casing providing an enclosure in surrounding relation to said locality of application of liquid coolant for confining, in cooperation with said upper work roll and said one back-up roll, a region which includes said locality and extends from a first level intermediate said locality and said roll bite to a second level above said line of contact, said casing including a first transversely arranged wall lying in close proximity to, but spaced from, the surface of the upper work roll to define therewith a first narrow gap at said first level between said upper work roll and said enclosure for preventing contact between said upper work roll and said enclosure at least along a working portion of said upper work roll surface as said upper work roll rotates, the direction of movement of said work roll outer surface past said first gap being into said enclosure,

e. said casing further including a second transversely arranged wall lying in close proximity to, but spaced from, the surface of said one back-up roll for defining a second narrow gap between said one back-up roll and said enclosure, the direction of movement of the outer surface of said back-up roll past said second gap being into said enclosure,

f. means for establishing a rapidly moving flow of air along the surface of said upper work roll adjacent said first gap in a direction for preventing downflow of coolant through said first gap while causing exit of air from said casing, thereby to seal at least said first gap against exit of coolant therethrough from said confined region, and

g. means for withdrawing coolant from within said casing.

4,061,011

EXTRUSION

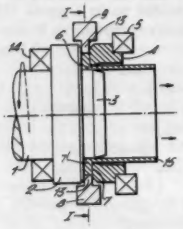
Derek Green, deceased, late of Aspatria, England, by Muriel Irene Green, executrix, Carlisle, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed July 29, 1976, Ser. No. 709,710

Claims priority, application United Kingdom, Aug. 6, 1975, 32942/75; Sept. 12, 1975, 37674/75

Int. Cl.[2] B21C *23/08*

U.S. Cl. 72—262 8 Claims



1. A process for the production of metal tube by continuous extrusion, comprising introducing non-molten metallic material to be extruded into a passageway extending in a closed loop and, at least over the major part of its length, being of progressively decreasing cross-section and formed between first and second members, of which said first member defines a greater surface portion of said passageway than does said second member, and moving the surface of the first member along said passageway relative to the second member to cause the material to be drawn along the passageway by frictional drag of said first member and to be fed to and extruded as a tube through an annular extrusion path adjacent to and in uninterrupted communication about its full circumference with a complete circuit of the closed loop of said passageway.

4,061,012

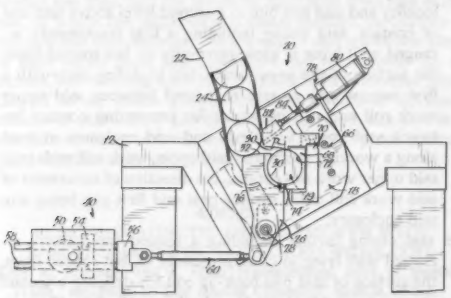
DRAWING AND IRONING MACHINE WITH POSITIVE CUP FEEDER

Elbert F. Wessman, New Lenox, Ill., assignor to National Can Corporation, Chicago, Ill.

Filed July 23, 1976, Ser. No. 708,230

Int. Cl.[2] B21D *22/00*

U.S. Cl. 72—347 6 Claims



1. In a drawing and ironing machine having an elongated, generally horizontal opening with ironing rings surrounding said opening at axially spaced locations along said opening, a ram axially aligned with said opening and cooperating with said iron rings for drawing and ironing a cup into a container sidewall and end wall, and cup feeding means for feeding cups to said machine, the improvement of said cup feeding means comprising guide means for receiving a continuous supply of cups, said guide means extending generally vertically adjacent said opening having a lower open end, an arm pivoted intermediate opposite ends thereof about a fixed axis below said open end of said opening, said arm having an arcuate surface on one end thereof conforming generally to the periphery of said cups, drive means connected to an opposite end of said arm for pivoting said arm between first and second positions with said arcuate surface aligned with said open end in said first position and with said opening in said second position so that said cups are positively moved along an arcuate path from said guide means to said opening, stop means located adjacent said opening for arresting movement of said cups and cooperating with the arcuate surface on said arm to align said cups with said opening, and said stop means having an arcuate surface generally opposed to said arcuate surface on said arm and defining an uninterrupted continuation thereof when said arm is in said second position so that said cups are gripped between said arcuate surfaces when said arm is in said second position with sufficient pressure so that out of round cups will be rounded out by the cooperative action of said arcuate surfaces.

4,061,013

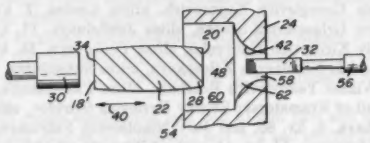
METHOD OF FORMING SOCKET WRENCHES

John Kuc, 213 Avondale Road, and Anthony Kuc, 601 Providence Road, both of Wallingford, Pa. 19086

Filed Sept. 29, 1976, Ser. No. 727,639

Int. Cl.[2] B21D *22/00*

U.S. Cl. 72—354 10 Claims



1. A method of forming forged socket wrenches devoid of machining operations including the steps of:

a. establishing solid metal billet having a predetermined volume, said billet having an extended dimension in a longitudinal direction;

b. squaring opposing longitudinal ends of said billet to form a pair of opposing substantially parallel planar faces being substantially normal to said longitudinal direction;

c. inserting said squared billet within an internal cavity of a female die having a through opening and adapted to form a taper on at least a portion of an external surface of said metal billet;

d. locating a first solid male die partially within said internal cavity tapered portion, said first male die having a cross-sectional area less than said female die through opening cross-sectional area; and,

e. longitudinally impacting a second end of said metal billet with a second male die to form a first socket recess, said billet being extruded around said first male die to form a second socket recess.

4,061,014

BOTTLE INSPECTION APPARATUS

Gerald J. Bott, 1941 Westwood Drive, NE., Grand Rapids, Mich. 49505; William C. Porter, 7530 28th Ave., Hudsonville, Mich. 49426, and Terrance M. Nowak, 1510 Pine, NW., Grand Rapids, Mich. 49504

Filed Oct. 27, 1976, Ser. No. 736,264

Int. Cl.[2] G01M *3/32*

U.S. Cl. 73—45.1 19 Claims

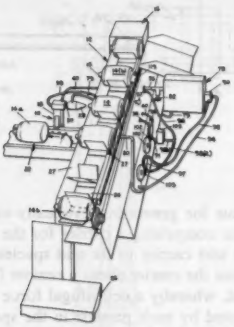
1. An apparatus for inspecting for leaks, dents, and other imperfections a plastic bottle having an open filling aperture, the apparatus comprising:

a nozzle shaped to seal against the bottle aperture and having means providing a sealing surface with the bottle aperture

when the nozzle is in engagement with the aperture, the nozzle further having a passage therethrough;

means for supplying gas at a first predetermined pressure to the nozzle air passage so that air can be supplied to the bottles when the nozzle is in sealing engagement with the apertures thereof;

means for measuring the rate at which the pressure builds up in a bottle to a second predetermined pressure above the



first predetermined pressure when the nozzle is in sealing engagement with the aperture thereof; and

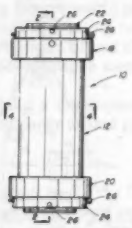
means coupled to the measuring means for indicating whether the rate at which the pressure buildup in the bottle is as great as or below a predetermined rate; whereby the presence of holes, as well as dents and deformations in the bottle, can be detected with the inspecting apparatus.

4,061,015

PIPE PRESSURE TESTING DEVICE

Frank L. Fish, Wichita, Kans., assignor to Weaver Engineering & Mfg. Co., Wichita, Kans.

Filed July 6, 1976, Ser. No. 702,743
Int. Cl.² G01M *3/04*
U.S. Cl. 73—49.5 **6 Claims**



1. A pipe pressure testing device for testing the strength of an elongated pipe specimen hydrostatically, the device comprising:

an elongated center tube having a smaller diameter and greater length than the pipe specimen, said center tube inserted inside the pipe specimen, the ends of said center tube extending outwardly from both ends of the pipe specimen;

a pair of hollow end caps, said end caps having a first inner circumference and a second inner circumference with a flange portion therebetween, the first inner circumference received around the ends of said center tube with the ends of said center tube extending therethrough, the second inner circumference received around the ends of the pipe specimen, the flange portion providing a seal between the outer circumference of said center tube and the inner circumference of the pipe specimen, one of said caps including a conduit therethrough and communicating with the outside of the cap and the space between the outer circumference of said center tube and the inner circumference of the pipe specimen, said circuit receiving pressure fluid therethrough; and

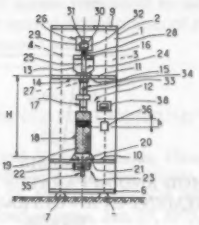
a pair of hollow restraining collars received around the outer circumference of the ends of said center tube and disposed adjacent the outside of said caps, and restraining pins inserted through apertures in said restraining collars and indexed with apertures in the ends of said center tube for securing said caps against the ends of the pipe specimen.

4,061,016

METHOD AND APPARATUS FOR MEASURING THE FOAM LIFE ON AN EFFERVESCENT BEVERAGE

Jean Pierre Noel, and Gilbert Bauer, both of Strasbourg, France, assignors to Ste Anonyme Dite Brasseries Kron Enbourg, Strasbourg, France

Filed Sept. 30, 1976, Ser. No. 728,401
Claims priority, application France, Dec. 24, 1975, 75.40409
Int. Cl.² G01N *21/24*
U.S. Cl. 73—60.1 **7 Claims**



1. A method of measuring the life of foam on a nonopaque liquid, said method comprising the steps of:

selectively pouring a predetermined quantity of said liquid from a preselected height into a vessel to cause formation of a predetermined level of foam on the surface of the liquid of the vessel;

rotating said vessel continuously on a support about a generally vertical axis and thereby rotationally entraining said liquid and said foam;

starting a timer substantially when said foam first forms on said surface;

directing a beam of light generally vertically and offset from said axis from one side through said foam and said surface as same rotate;

measuring the intensity of said beam on the other side of said surface and said foam; and

stopping said timer when the measured intensity of said beam is greater than a predetermined threshold level, whereby the elapsed time between starting and stopping of the timer is indicative of the life of said foam.

4,061,017

STRUCTURAL ANALYSIS SYSTEM

Edwin A. Sloane, Los Altos, and Bruce T. McKeever, Mountain View, both of Calif., assignors to Time/Data Corporation, Santa Clara, Calif.

Filed Nov. 17, 1975, Ser. No. 631,555
Int. Cl.² G01M *7/00*
U.S. Cl. 73—579 **44 Claims**

1. A system for determining the modal characteristics of a structure comprising:

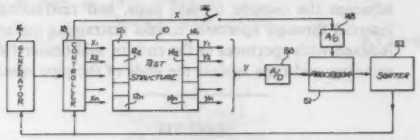
a plurality of shakers coupled to said structure;

means for applying to said shakers a plurality of driving signals having a common preselected complex frequency

and a preselected set of amplitudes and phases corresponding to a mode of interest;

means for sensing the response of said structure to said driving signals;

means for receiving said driving signals and said sensed response and for generating a set of transfer functions in



the complex frequency domain characteristic of said structure corresponding to said mode of interest, and set of transfer functions containing the complex frequencies and complex residues of said mode of interest; and

means for sorting said complex frequencies and said complex residues to obtain a complex frequency and a set of amplitudes and phases corresponding to said mode of interest.

4,061,018

METHOD AND APPARATUS FOR DISTANCE MEASUREMENT IN AN ULTRASONICS SCANNING IMAGE

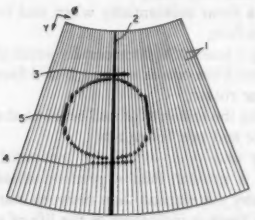
Christoph Benedikt Burckhardt, Muttenz; Pierre-André Grandchamp, Munchenstein, both of Switzerland, and Heinz Hoffmann, Grenzach, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 28, 1976, Ser. No. 681,110

Claims priority, application Switzerland, May 5, 1975, 5742/75

Int. Cl.² G01N 29/00

U.S. Cl. 73—629 **8 Claims**



1. Method for distance measurement in an ultrasonic scanning image in ultrasonic diagnostics, by means of pulse echo methods and employing an ultrasonic transducer, characterized by incorporating into the image measurement marks which can be displaced along or parallel to a recording line so as to be brought into coincidence with image points, electronically measuring a time interval between brightening of two such marks and simultaneously electronically computing and displaying the actual distance between points of an object under examination which correspond to the image points to which the distance measuring marks are set, the velocity of propagation of the ultrasonic waves within the object being taken into account in said computing of the actual distance.

4,061,019

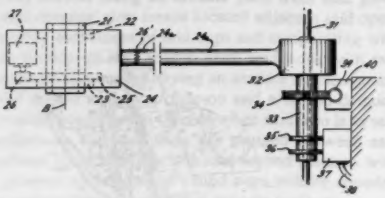
APPARATUS FOR GENERATING FORCES IN A SPECIMEN

David H. Biasetti, 7019 Guilford Road, Philadelphia, Pa. 19082

Filed Mar. 16, 1976, Ser. No. 667,450

Int. Cl.² B06B 1/10

U.S. Cl. 73—662 **9 Claims**



1. Apparatus for generating cyclically-varying forces in a solid specimen comprising a carrier for the specimen, mounting means in said carrier to fix said specimen in said carrier, means to rotate the carrier about a remote first axis at a given angular speed, whereby a centrifugal force radial to said first axis is generated by each particle in the specimen, means for effecting rotation of said specimen about a second axis perpendicular to the direction of the radial centrifugal force to thereby cyclically reverse the orientation of the centrifugal force generated by each particle in the specimen.

4,061,020

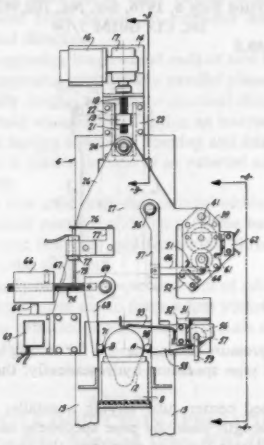
DEFORMETER

Robert B. Fridley; Pictiaw Chen; James J. Mehlschau, and Lawrence L. Claypool, all of Davis, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 13, 1976, Ser. No. 714,184

Int. Cl.² G01N 3/48

U.S. Cl. 73—81 **17 Claims**

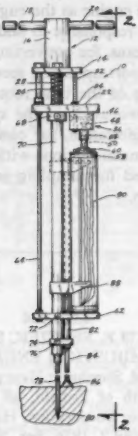


1. A deformeter for testing the maturity of fruit comprising a frame, means for supporting a fruit on said frame, means on said movable into contact with said fruit, means for pressing said movable means into contact with said fruit to establish a datum position, means for limiting the pressure exerted on said fruit by said movable means, means for disabling said limiting means and for pressing said movable means into contact with said fruit under a predetermined load to establish an indented position, and means for detecting the difference between said datum position and said indented position.

4,061,021
RECORDING SOIL PENETROMETER

William I. Baldwin, and Wesley F. Buchele, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jan. 28, 1977, Ser. No. 763,572
Int. Cl.[2] G01N 3/40
U.S. Cl. 73—84 6 Claims



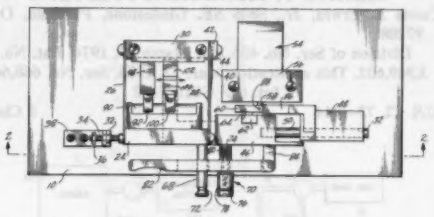
1. A penetrometer comprising,
a frame means having upper and lower ends,
a probe means on the lower end of said frame means for penetrating the soil,
ground engaging means vertically movably mounted on the lower end of said frame means,
a handle means operatively yieldably vertically movably mounted on the upper end of said frame means,
a recording drum means rotatably mounted, about a vertical axis, on said frame means and being adapted to have recording paper thereon,
a scriber means operatively connected to said ground engaging means for scribing the recording paper,
and means operatively interconnecting said handle means to said drum for causing rotation of said drum relative to the force required to cause said probe means to penetrate the soil,
said scriber means scribing a depth-penetration resistance graph on the recording paper as said probe is penetrating the soil.

4,061,022
HAIR TESTING APPARATUS

Robert W. Yates, Woodland Hills, Calif., assignor to Redken Laboratories, Inc., Van Nuys, Calif.

Filed July 19, 1976, Ser. No. 706,631
Int. Cl.[2] G01N 3/08
U.S. Cl. 73—95 4 Claims

1. A tensile tester for strands of hair comprising a frame, a first movable member, a pair of parallel flat springs secured at one end to the first movable member and anchored at the other end to the frame for movably supporting the first member from the frame, a second movable member, means for driving the second member relative to the frame in a continuous uninterrupted cycle along a predetermined linear path extending substantially perpendicular to said flat springs from an initial position through a fixed displacement away from the first member and return to the initial position, means for securing a hair sample to the two movable members, a stop mounted on the frame and engaging the first movable member in an initial position, the flat springs urging the first movable member against the stop, a scale member mounted on the first movable member having a plurality of equally spaced indicia extending therealong, the indicia being spaced along a direction parallel to the direction of movement of the first member, first counting means including a first sensor mounted on the frame for counting the number of indicia passing the sensor with movement of the first member, and means responsive to said first counting means for generating a digital output of the number

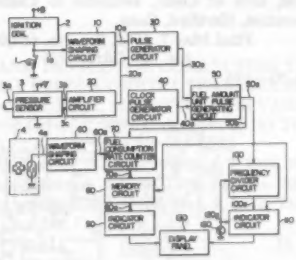


of indicia sensed by the first sensor, second counting means including a second sensor mounted on the second movable member for counting the number of indicia passing the second sensor with relative movement between the first and second movable members, and means responsive to said last-named means for generating a second digital output of the number of indicia sensed by the second sensor.

4,061,023
FUEL-METER-COMBINED FUEL CONSUMPTION RATE METER

Akira Kuno, Nagoya, and Yoshio Shinoda, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 25, 1975, Ser. No. 635,269
Claims priority, application Japan, Jan. 27, 1975, 50-12180[U]
Int. Cl.[2] G01F 9/02
U.S. Cl. 73—114 2 Claims



1. A fuel-meter-combined fuel consumption rate meter for engine-mounting vehicles comprising:
measuring means for generating an output signal indicative of the momentary amount of fuel consumed by the running vehicle,
computing means for computing the momentary rate of fuel consumption and generating an output signal thereof from said output signal of said measuring means,
first indicating means comprising an ammeter with a needle responsive to said computing means output for indicating said momentary fuel consumption rate thereon in analog form in response to said output signal of said computing means,
integrating means connected to said measuring means for generating an output signal indicative of an accumulative amount of fuel consumed by integrating said output signal of said measuring means, and
second indicating means comprising a plurality of digital

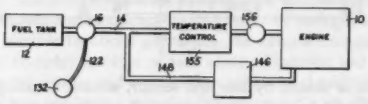
display elements for indicating in digital form said accumulative fuel amount on said ammeter of said first indicating means in response to said output signal of said integrating means.

4,061,024

FUEL MEASURING SYSTEM FOR ENGINES AND METHOD OF MONITORING FUEL FLOW

Curtis L. Erwin, Jr., 5805 SE. Gladestone, Portland, Oreg. 97208

Division of Ser. No. 456,264, March 29, 1974, Pat. No. 3,949,602. This application Mar. 22, 1976, Ser. No. 668,663
Int. Cl.² G01F *9/02*
U.S. Cl. 73—114 **8 Claims**



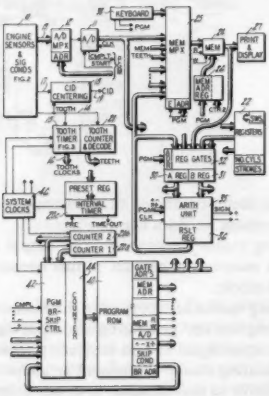
6. A fuel measuring system in combination with an engine, fuel supply means for said engine, said engine being of the type in which a portion of the fuel fed thereto in unburned, a return line from said engine arranged to recirculate unburned fuel back to the engine, treatment means having means for connection in said measuring system, measuring means having a movable member, an electric circuit, magnetic pickup means in said circuit actuated by said movable member, and recording means responsive to said pickup means making a record of the rate of fuel flowing through said measuring means.

4,061,025

SPEED-RELATED INDICATION COMPARISONS IN INTERNAL COMBUSTION ENGINE DIAGNOSTICS

James F. Willenbecher, East Windsor, and Lee R. Armstrong, Enfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 7, 1976, Ser. No. 684,036
Int. Cl.² G01L *3/00*
U.S. Cl. 73—116 **6 Claims**



1. Apparatus for measuring a parameter on an internal combustion engine in relation to a predetermined specification speed, comprising:

means for registering at least one speed data manifestation identifying a test speed at which a corresponding parameter of an engine is to be measured;

a transducer adapted to be disposed with respect to the engine to sense said parameter and provide a parameter signal indicative thereof;

speed sensing means, adapted to be disposed for response to mechanical movement of a portion of the engine in relationship to the angular revolutions of the engine, for repetitively providing successive measured data manifestations of the time elapsed during angular revolution of the engine through a known angle and therefore indicative of the speed of the engine as the engine rotates; and

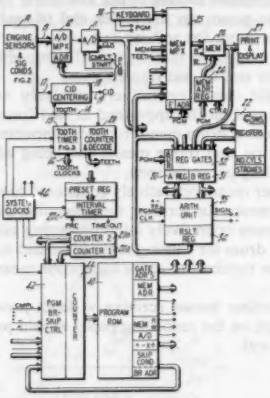
processing means, responsive to said registering means and to said speed means, for converting said speed data manifestation into a corresponding specification data manifestation indicative of the time required for the engine to rotate said known angle at the speed indicated by said speed data manifestation, for comparing said successive measured data manifestations with said specification data manifestation and for sampling said parameter signal in response thereto.

4,061,026

FULL THROTTLE, SPECIFIC SPEED TESTS IN INTERNAL COMBUSTION ENGINE DIAGNOSTICS

Harvey J. Goodfriend, Simsbury; Henry J. Mercik, Jr., and Lee R. Armstrong, both of Enfield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 7, 1976, Ser. No. 684,329
Int. Cl.² G01L *3/00*
U.S. Cl. 73—116 **11 Claims**



1. Apparatus for testing an internal combustion engine while operating under open throttle conditons without the need of a dynomometer, comprising:

transducer means adapted to be disposed for response to an engine-related parameter, a measurement of which is desired with the engine operating under open throttle conditions;

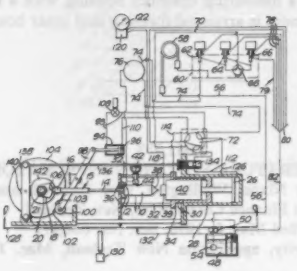
speed sensing means adapted to be disposed to sense rotation of the engine under test through an angular increment which is substantially less than a revolution of the engine as related to time in a fashion to provide an indication of speed on a sub-revolution basis; and

processing means responsive to said speed means for successively monitoring the speed indication provided by said speed sensor means as said engine is accelerating and, in response to said indications indicating that the engine has reached a speed in excess of a predetermined speed, sampling the output of said transducer means.

4,061,027
FUEL INJECTOR TESTING APPARATUS

Reginald Stanley Emerson, Buckingham, England, assignor to Leslie Hartridge Limited, England

Filed Oct. 15, 1976, Ser. No. 732,780
Claims priority, application United Kingdom, Oct. 17, 1975, 42668/75
Int. Cl.² G01M *3/28*
U.S. Cl. 73—119 A 15 Claims

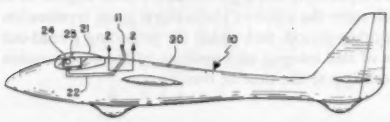


1. Apparatus for testing fuel injectors having a fuel delivery nozzle at one end and their own in-built high-pressure pump, the apparatus comprising a hydraulic clamp for engaging and thus clamping the nozzle end of the injector into a fuel-collecting nose assembly, the nose assembly including a valve which is loaded by a spring which simulates pressure conditions prevailing in an engine cylinder with which the injector is designed to be used, and a composite fuel system for supplying fuel to the injector and to different parts of the apparatus, the said fuel system including at least one valve having at least one weight acting on it to produce fuel at a pressure determined by the weight.

4,061,028
AIRCRAFT TOTAL ENERGY SENSOR

Oran W. Nicks, 425 Elizabeth Lake Drive, Hampton, Va. 23669

Filed Feb. 25, 1977, Ser. No. 772,166
Int. Cl.² G01C *21/00*
U.S. Cl. 73—179 11 Claims



1. An energy sensor probe for providing a signal representative of changes in useful total energy for an aircraft during flight comprising:

an elongated tubular member positioned on the exterior of the aircraft and having an open end and a closed end,

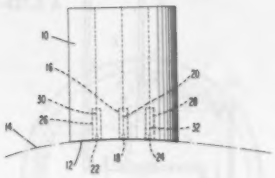
said closed end of said tubular member being angularly inclined forward relative to the direction of flight of the aircraft and provided with a single orifice formed in the aft portion thereof and spaced from said closed end,

said open end of said tubular member being in fluid connection with a sensitive variometer whereby, during aircraft flight the laminar air flow around said tubular member produces pressures which vary with changes in aircraft velocity and altitude that are proportional to changes in total energy pressure and these changes being detected by the energy sensor probe and indicated by the variometer.

4,061,029
FLOW SEPARATION DETECTOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of George C. Mateer, Los Gatos, Calif., and Aviel Brosh, Haifa, Israel

Filed Aug. 6, 1976, Ser. No. 712,419
Int. Cl.² G01C *21/00*
U.S. Cl. 73—180 9 Claims

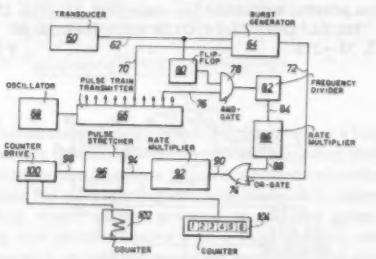


1. A flow separation detector or the like comprising a body with a low thermal conductivity, said body having a surface adapted to be aligned with and become part of the surface from which the flow separation is to be detected, a heater conductor having a longitudinal axis, two temperature sensing conductors each having a longitudinal axis, said conductors being mounted substantially flush with said body surface so as to minimize flow interference, said temperature sensing conductors being mounted on opposite sides of said heater conductor in the direction of the flow to be detected, means for heating said heater conductor, means for measuring the temperature differential between said temperature sensing conductors, said differential being a function of the flow separation.

4,061,030
METHOD AND DEVICE FOR CORRECTING THE OUTPUT SIGNAL FROM A DIGITAL TRANSDUCER FOR MEASURING A PHYSICAL MAGNITUDE OR VARIABLE

Tor Lennart Bernt Grivérus, Nasbydalsvagen 6, 183 31 Taby, Sweden

Continuation-in-part of Ser. No. 522,789, Sept. 7, 1976, Pat. No. 3,978,727. This application July 28, 1976, Ser. No. 709,432
Claims priority, application Sweden, Nov. 9, 1973, 7315252
Int. Cl.² G01F *1/05*
U.S. Cl. 73—194 E 11 Claims



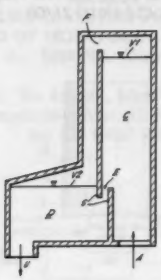
2. The method of claim 1, in which the step of gating the pulses of said one substrain with said transducer pulses to produce correction pulses includes limiting the number of correction pulses produced for each transducer pulse when the transducer frequency falls below its lowest operating value.

4,061,031

COMBINATION OF FLOW METER AND BUBBLE TRAP

Lars Grimsrud, P.O. Box 1379, Salmon, Idaho 83467

Filed Nov. 5, 1975, Ser. No. 628,971
Int. Cl.[2] A61B 5/02; A61M 1/03; G01F 1/20, 15/08
U.S. Cl. 73—200 7 Claims



1. An apparatus for measuring the flow rate of and for releasing entrapped air bubbles in a blood stream which has been extracted temporarily from a patient for extracorporeal treatment comprising

a closed container having an inlet opening and an outlet opening therein so that the blood stream can flow therethrough,

a vertically disposed partition means for dividing the container into two chambers, respective ones of which are in direct communication with each of the openings to thereby form inlet and outlet chambers,

first opening means in said partition means above the level of said inlet opening and said outlet opening, said first opening means being of a smaller cross-section than the inlet opening so that blood accumulates in said inlet chamber to a depth at which said first opening is sufficiently below the surface of the blood in the inlet chamber that increased pressure equalizes the blood flow rate through said first opening means thereby controlling the flow of the blood stream therethrough from said inlet chamber to said outlet chamber so that the height of blood in said inlet chamber is a function of the blood flow rate, and

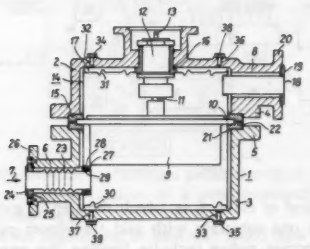
second opening means in said partition means adjacent the top thereof for equalizing the air pressure in said closed container between said inlet and outlet chambers.

4,061,032

LIQUID FLOW METER OR THE LIKE FOR CORROSIVE LIQUIDS UNDER PRESSURE

Eberhard Friebel, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 9, 1976, Ser. No. 721,691
Claims priority, application Germany, Sept. 12, 1975, 2541246
Int. Cl.[2] G01F 15/14; G12B 9/02; F16L 58/00
U.S. Cl. 73—273 9 Claims



1. In a liquid fitting for corrosive liquids under pressure, comprising a pressure resistant outer housing, an inner housing and a space filled with a liquid to be measured between the outer and the inner housings, the improvement comprising:

a. a thin walled corrosion resistant elastic lining, forming a hollow wall attached to the inside surfaces of the outer housing, and

b. a noncorrosive liquid medium filling said hollow wall.

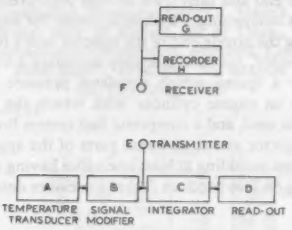
2. Apparatus according to claim 1 wherein said fitting is a liquid flow meter for measuring a corrosive liquid under pressure in which a measuring chamber housing with a movable measuring element is arranged forming said inner housing.

4,061,033

TEMPERATURE FUNCTION INTEGRATOR

Peter Anthony Nixon, Wellington, New Zealand, assignor to Development Finance Corporation, New Zealand

Filed Mar. 8, 1976, Ser. No. 664,475
Claims priority, application New Zealand, Mar. 10, 1975, 176879
Int. Cl.[2] G01D 1/04, 3/02; G01N 33/02
U.S. Cl. 73—339 R 8 Claims



1. A temperature function integrator comprising: a transducer which senses temperature in a material being monitored and produces an electrical quantity proportional to the sensed temperature, an analogue-to-digital converter means for converting the transducer output to digital form, a digital memory loaded with temperature - rate of deterioration data which outputs in digital form the rate of deterioration corresponding to the temperature sensed at that instant, means which integrate the output from the digital memory with respect to time and which store the value of the integral upon termination of the monitoring period, and means for providing a read-out of the value of said integral as a measure of the deterioration of said material up to the time of reading.

4,061,034

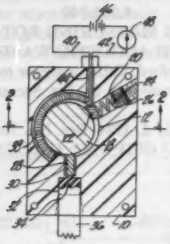
FLUID PRESSURE SENSING DEVICE

Gerard T. Perkins, 19934 Southfield Road, Detroit, Mich. 48235

Continuation-in-part of Ser. No. 599,050, July 25, 1975, abandoned. This application Apr. 9, 1976, Ser. No. 675,444
Int. Cl.[2] G01L 9/02, 7/08, 7/16
U.S. Cl. 73—398 AR 20 Claims

1. A fluid pressure responsive device comprising a housing; a chamber formed in said housing and having a curved wall section; a spherical member disposed within said chamber and having a curved surface formed on a radius smaller than that of said wall section whereby the circular surface of said member engages said curved wall section at different points depending upon the position of said member in said chamber; and fluid

pressure means exerting a force on said member such that the position of said member in said chamber is a function of the



magnitude of the fluid pressure exerted by said last mentioned means.

4,061,035

DIAPHRAGM ARRANGEMENT FOR PRESSURE TRANSDUCERS

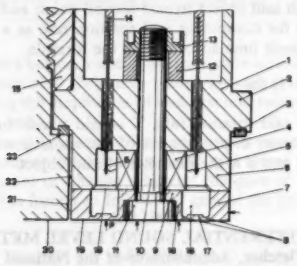
Günther Witzke, Seuzach, and Hans Ulrich Baumgartner, Winterthur, both of Switzerland, assignors to Kistler Instrumente AG, Winterthur, Switzerland

Filed Nov. 10, 1975, Ser. No. 630,515

Claims priority, application Switzerland, Nov. 8, 1974, 014967/74

Int. Cl.² G01L 7/08

U.S. Cl. 73—406 **25 Claims**



1. A diaphragm arrangement for a pressure transducer especially for use in monitoring an internal combustion engine, said transducer having a force measuring transducer element, said diaphragm arrangement comprising:

an outer ring portion;

an inner ring portion;

an elastic portion interconnecting said outer ring portion to said inner ring portion;

at least each of the inner and outer ring portions of said diaphragm arrangement forming a first surface coplanar with a surface by way of which said pressure transducer is mounted for measuring an input force applied thereto, and the inner ring portion having a second surface which provides support for said transducer element; and

means, coupled to said force measuring transducer element and said inner ring portion, for applying a preload to said force measuring transducer element.

4,061,036

DEVICE FOR THE EXTRACTION OF GASEOUS SAMPLES AND FOR THERMAL MEASUREMENT ABOVE THE BURDEN OF A SHAFT FURNACE

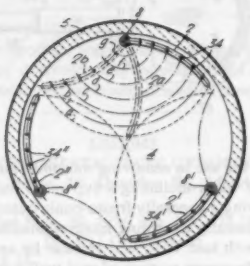
Edouard Legille, Luxembourg, Luxembourg, assignor to S.A. des Anciens Etablissements Paul Wurth, Luxembourg

Filed July 20, 1976, Ser. No. 706,947

Claims priority, application Luxembourg, July 24, 1975, 73050

Int. Cl.² G01N 1/22

U.S. Cl. 73—421.5 A **10 Claims**



1. A device for the extraction of gaseous samples and for thermal measurement above the burden of a shaft furnace, the device comprising at least one probe arm permanently positioned in a substantially horizontal plane above the burden; a series of apertures distributed over the entire length of the probe arm and conduits communicating separately with each of the apertures and with the exterior of the furnace; and means for pivoting the probe arm from a rest position juxtaposed the inside wall of said shaft furnace across and above the burden in such a way as to scan practically the entire surface of the burden, said pivot means having at least one pivot axis juxtaposed the inside wall of said shaft furnace.

4,061,037

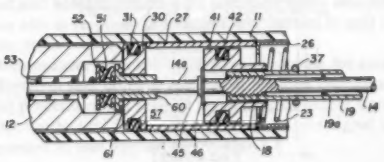
PIPETTES

William P. Keegan, 155 Beach 133rd St., Belle Harbor, N.Y. 11694

Filed Sept. 20, 1976, Ser. No. 724,920

Int. Cl.² B01L 3/02

U.S. Cl. 73—425.6 **11 Claims**

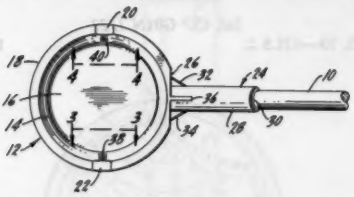


1. A pipette comprising an overblow piston having a longitudinal aperture therein, plunger rod means extending through the aperture in said overblow piston in a non-airtight relationship, means for reciprocating said rod means with respect to said piston, washer means mounted on said rod means for engaging said piston to move it to a fixed position, sealing means mounted on said rod means for movement into engagement with said piston to form an airtight relationship between said rod means and said piston and for moving said piston away from its fixed position, and means for adjusting the spacing between said washer means and said sealing means whereby the distance moved by said piston from its fixed position is adjustable.

4,061,038
MOSQUITO LARVAE DIPPER

John L. Clarke, Jr., Riverside, Ill., assignor to Clarke Outdoor Spraying Co., Inc., Roselle, Ill.

Filed Jan. 24, 1977, Ser. No. 761,643
Int. Cl.[2] G01F *19/00*
U.S. Cl. 73—427 4 Claims



1. A dipper for use in removing mosquito larvae or the like from bodies of water including a cup and a handle,

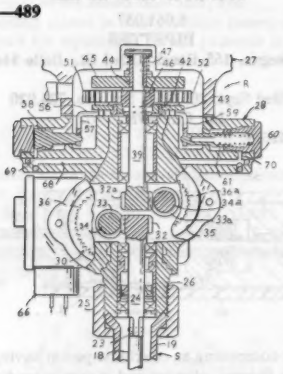
said cup having a generally frusto-conic outer wall terminating in a laterally extending integral annular lip, a bottom integral with said wall, said annular lip and the adjacent areas of the upper portion of said wall forming generally diammetrically opposed pouring grooves, said grooves extending below the level of said lip, with the lip being continuous in size and shape throughout said grooves,

a handle support integral with said cup and extending outwardly from said cup wall, said handle support having a coaxially arranged cylindrical opening for mounting said handle, and a plurality of handle support fillets integral with said cup wall and handle support.

4,061,039
LOCOMOTIVE SPEED RECORDER SYSTEM

Livio F. Marcantonio, Utica, and Marcel P. D'Haem, New Hartford, both of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Apr. 8, 1976, Ser. No. 674,861
Int. Cl.[2] G01P *1/04, 1/06*
U.S. Cl. 73—489 12 Claims

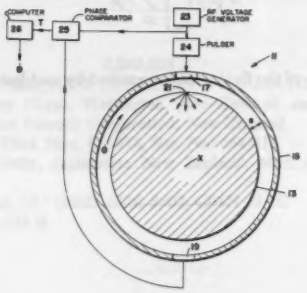


1. A speed recorder system comprising a speed recorder assembly having a primary input shaft, a drive unit having an input drive shaft connectible to an axle of a drive wheel of a locomotive, an output shaft from the drive unit, speed reduction gearing connecting the input drive shaft with the output shaft at an angle of 90°, a flexible drive cable connecting the output shaft with the primary input shaft, means to operatively disconnect the output shaft from the flexible drive cable, speed recording mechanism in the recorder assembly, and changeable gearing drivingly connecting the primary input shaft to the recording mechanism at a gear ratio selected to compensate for the R.P.M. reduction at the drive unit and to correct for a specific wheel diameter of the locomotive.

4,061,040
APPARATUS FOR MEASURING ROTATION RATES WITH ACOUSTIC WAVES

Herbert J. Shaw, Stanford, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 2, 1976, Ser. No. 702,175
Int. Cl.[2] G01P *3/42;* G01C *21/00*
U.S. Cl. 73—505 8 Claims



1. An apparatus for measuring the rotation rate of a spherical object of an isotropic material about axes passing through its center comprising:

a. means for exciting an acoustic wave at a first point on the surface of said object;

b. means for sensing the arrival of said acoustic wave on the surface of said object at a second point diametrically opposite to said exciting means, said exciting means and said sensing means being spaced apart from said object;

c. means for measuring the transit time required for said acoustic wave excited at said first point to propagate through said object to said second point; and

d. means for computing said rotation rate as a function of said transit time according to the formula

$$\theta = (2/T)\cos^{-1}(vT/d)$$

where θ is said rotation rate, T is said transit time, v is the acoustic velocity of propagation of said acoustic wave through said object, and d is the diameter of said object.

4,061,041
DIFFERENTIAL SOUND LEVEL METER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Allan J. Zuckerwar, Newport News, Va.

Filed Nov. 8, 1976, Ser. No. 740,156
Int. Cl.[2] G01H *3/12*
U.S. Cl. 73—646 4 Claims

1. A device for measuring small differences between two relatively high sound pressure levels comprising:

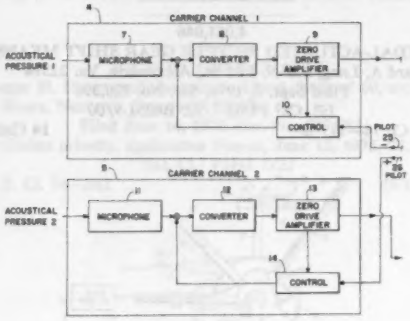
a first carrier channel means responsive to a first of said sound pressure levels for producing a first electrical signal proportional to said first sound pressure level;

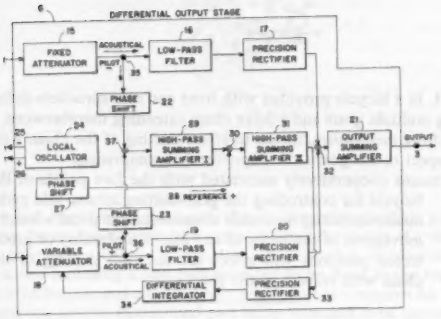
a second carrier channel means responsive to the second of said sound pressure levels for producing a second electrical signal proportional to said second sound pressure level;

means receiving said first and second electrical signals for producing a third electrical signal that is proportional to the difference between said first and second electrical signals whereby said third electrical signal is proportional to the difference between said two sound pressure levels;

said means including means for changing the amplitude of said first electrical signal and means for changing the amplitude of said second electrical signal the last said means including means responsive to an electrical signal for varying the amount of change;

means for inserting equal amplitude electrical signals into said first and second carrier channels and for obtaining the





difference between said equal amplitude insertions electrical signals after they have passed through said means for changing the amplitudes of said first and second electrical signals; and

means for applying said difference between said equal amplitude insertion electrical signals to said means for varying the amount of change whereby the gain of the second channel is forced to follow the gain of the first channel.

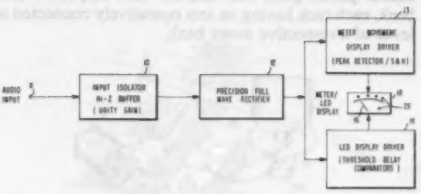
4,061,042

AUDIO SIGNAL MONITORING SYSTEM WITH DISPLAY OF TWO SIGNAL CHARACTERISTICS

Wayne L. Hetrich, District Heights, Md., assignor to Corporation for Public Broadcasting, Washington, D.C.

Filed May 12, 1975, Ser. No. 576,746
Int. Cl.² G01H *3/12*
U.S. Cl. 73—647 **24 Claims**

1. An indicating instrument for displaying characteristics of an audio frequency signal subject to variations in amplitude, comprising high impedance input means for producing a first signal having a voltage varying in amplitude in proportion to said amplitude variations of said audio frequency signal, a display device including a meter for indicating instantaneous peaks in said amplitude variations and means for indicating sustained peaks in said amplitude variations, said indicating means comprising a plurality of light emitting diodes respectively corresponding to different predetermined threshold levels, a peak detector circuit responsive to variations in said first signal for driving said meter, and threshold circuit means supplied with said predetermined threshold levels and responsive to said first signal for selectively energizing said light


AUDIO INPUT
INPUT ISOLATOR (1-2 BUFFER (UNITY GAIN))
PRECISION FULL WAVE RECTIFIER
METER/LED DISPLAY
METER MOVEMENT DISPLAY DRIVER (PEAK DETECTOR / S & H)
LED DISPLAY DRIVER (THRESHOLD DELAY COMPARATORS)

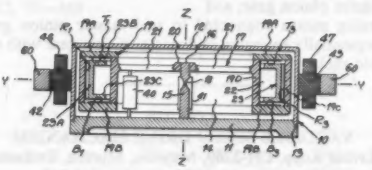
emitting diodes upon the amplitude of said first signal attaining said respectively corresponding predetermined threshold levels for a predetermined sustained period of time.

4,061,043

ELECTROSTATIC RATE GYROSCOPE

John Callender Stiles, 10 Abingdon St., Morris Plains, N.J. 07950

Filed Mar. 29, 1976, Ser. No. 671,257
Int. Cl.² G01C *19/28*
U.S. Cl. 74—5.6 D **16 Claims**



1. A gyroscope having a spin axis and at least one input axis comprising

a rotor housing having a toroidal cavity therein concentrically disposed about said spin axis;

mounting means for mounting said rotor housing to permit rotation thereof about at least one precession axis;

a rotor having a cylindrical body portion with projecting flange means thereon concentrically disposed within said cavity about said spin axis;

electrostatic suspension means for suspending said rotor within said cavity to permit rotor rotation about said spin axis and to prevent relative angular rotation between said housing and said rotor about said one precession axis, so that said housing rotates with said rotor about said precession axis in response to an input rate applied to said input axis; and

force transducer means coupled to said housing for exerting a force on said housing to prevent rotation thereof about said precession axis and for producing an output signal in response to said force, whereby said output signal is responsive to said applied input rate.

4,061,044

METER SETTING INDEXING GEAR APPARATUS

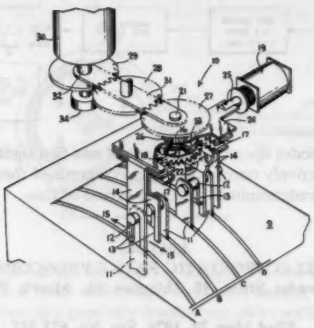
James R. Swaniger, Bridgeport, and Keith E. Schubert, Rowayton, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Aug. 6, 1976, Ser. No. 712,379
Int. Cl.² F16H *19/04*
U.S. Cl. 74—31 **10 Claims**

1. The combination of a lever operated mechanical postage meter having a number of levers to set postage, and a conversion apparatus for converting the mechanical postage meter into an electrically controlled postage meter, the combination further comprising:

a rotatably mounted, movably adjustable master pinion gear for sequential engagement with a plurality of racks;

a number of racks, each for sequential engagement with said master pinion gear, one rack for each respective meter bank, each rack having an arm operatively connected to a lever of a respective meter bank;



a pivotable drive means operatively connected to said master pinion gear for rotating said master pinion gear to cause each of said racks to move when engaged with said master pinion gear; and

indexing means connected to said master pinion gear for sequentially engaging said master pinion gear with each of said racks.

4,061,045

VARIABLE SPEED DRIVE MECHANISM

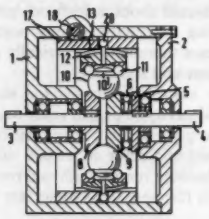
Jean Ernest Kopp, CH-3280, Meyriez, Murten, Switzerland

Filed Aug. 30, 1976, Ser. No. 718,768

Claims priority, application Switzerland, Sept. 11, 1975, 11831/75

Int. Cl.² F16H *13/02, 13/04*

U.S. Cl. 74—198 **9 Claims**



1. A drive mechanism providing a speed ratio that is infinitely variable between predetermined limits, the mechanism comprising a casing, driving and driven shafts mounted to rotate in said casing about a common axis fixed with respect to said casing, driving and driven members respectively mounted for rotation with said shafts and respectively formed with frusto-conical friction surfaces facing one another for supporting a control sphere therebetween, at least one control sphere mounted between said surfaces in frictional engagement therewith, a circular rolling bearing assembly engaged by a portion of said sphere remote from said surfaces, said circular rolling bearing assembly having its axis passing through the centre of said control sphere, an adjusting member mounted in said casing for linear to-and-fro movement parallel to said axis, a control segment interposed between said rolling bearing assembly and said adjusting member, said control segment being formed with an arcuate surface on a side thereof remote from said rolling bearing assembly, said arcuate surface being centred on the center of said control sphere, said adjusting member being formed with a flat surface in contact with said arcuate surface, and said adjusting member and said control segment being formed with interengaging elements arranged for said arcuate surface to roll on said flat surface when said adjusting member undergoes said linear movement, and means for effecting said linear movement, thereby angularly adjusting said axis of said rolling bearing assembly with respect to said common axis of said shafts to vary said speed ratio.

4,061,046

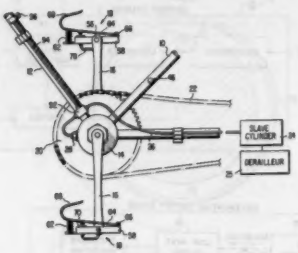
PEDAL-ACTUATED BICYCLE GEAR SHIFT MEANS

Richard A. Lang, 215 N. Pitt St., Alexandria, Va. 22314

Filed Sept. 3, 1976, Ser. No. 720,396

Int. Cl.² F16H *7/22;* B62M *9/00*

U.S. Cl. 74—217 B **14 Claims**



1. In a bicycle provided with front and rear sprockets defining multiple gears and a drive chain extending therebetween, a shifting mechanism, means to effect shifting of the chain with respect to the gears, the improvement comprising:

means cooperatively associated with the foot pedals of the bicycle for controlling the gear-shifting means, said pedal means including moveable elements on the pedal whereby movement of the pedal to any one of a plurality of preselected positions will effect the requisite shifting of the chain with respect to the gears.

4,061,047

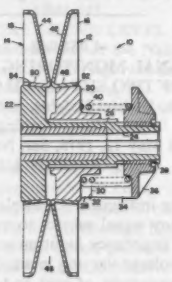
PULLEY HALF MOUNTING OF VARIABLE SPEED PULLEY

Thomas Charles Newhouse, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.

Filed Sept. 20, 1976, Ser. No. 724,631

Int. Cl.² F16H *55/52*

U.S. Cl. 74—230.17 C **3 Claims**



1. In a variable speed pulley including first and second pulley halves respectively including first and second belt engaging portions connected to first and second hubs adapted for being mounted on a drive shaft for rotation therewith with the first hub being axially fixed on the shaft and the second hub being axially slidable on the shaft; the improvement comprising: said

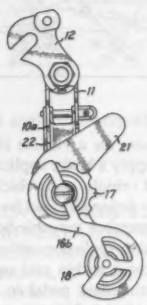
first and second hubs respectively defining first and second annular outer conically tapered surfaces with the first tapered surface inclined radially outwardly in a direction away from the second hub and with the second tapered surface being inclined radially outwardly in a direction away from the first hub; and said first and second belt engaging portions respectively including first and second centrally located openings defined by first and second axially extending flanges respectively press fit onto said first and second inclined surfaces.

4,061,048

BICYCLE GEAR CHANGE

Roger H. Huret, and Jacques A. Huret, both of 60, av. Felix Faure, Nanterre, France (F 92000)

Filed June 14, 1976, Ser. No. 695,883
Claims priority, application France, June 12, 1975, 75.18467
Int. Cl.[2] F16H 7/22
U.S. Cl. 74—242 **10 Claims**



1. A derailleur bicycle gear change comprising a chain guiding device having a pivoted yoke carrying the pivots of a chain guide roller and a chain tension roller and a displacement device including a first part arranged to be fixed to the frame of the bicycle and a second part which acts as a support for the guiding device, said second part being arranged to be movable in relation to the first part in order to cause the guiding device to move transversely in relation to the rear wheel of the bicycle gear change along sprockets associated with the wheel, the guiding device incorporating a guiding member in the form of a guiding lug mounted so as to pivot in relation to said yoke in a plane perpendicular to the axis of the sprockets and common to that of a cheek of the yoke, and the gear change further comprising a mechanical linkage device connected to said displacement device and arranged to cause the guiding lug to pivot when said guiding device moves transversely so as to bring the free extremity of the guiding lug adjacent the circumference of the sprocket whose position corresponds to that of the guiding device.

4,061,049

MECHANISM FOR CHANGING LINEAR MOTION TO SUBSTANTIALLY PIVOTAL MOTION

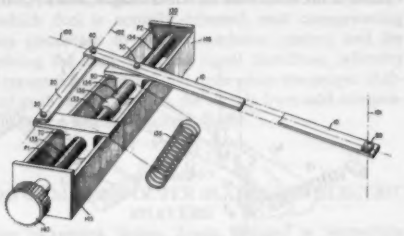
Henry Richard Beurrier, Chester Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 13, 1976, Ser. No. 686,069
Int. Cl.[2] F16H 1/14
U.S. Cl. 74—424.8 R **7 Claims**

1. An apparatus for generating substantially pivotal motion of an axis of a member about a remote point on the axis, comprising

means for driving a first point on the axis of the member along a straight path throughout the extent of its travel and a second point along a curved path, which paths are transverse to the axis, and

means in the driving means for correlating the motion of the driven points so as to drive the points in substantially the same direction at such differential rates of travel that the remote point on the axis, on the other side of the slower



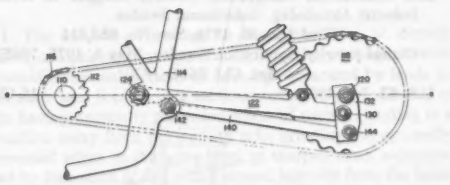
driven point from the faster, experiences minimal lateral displacement as the driven points are displaced from an initial position.

4,061,050

COMPENSATING MECHANISM

Joseph Earl Bolger, Summer St., Barre, Mass. 01005

Filed Sept. 10, 1976, Ser. No. 722,022
Int. Cl.[2] G05G 1/00; B62D 3/00
U.S. Cl. 74—469 **3 Claims**



1. In a motorcycle having an engine mounted on a frame and a transmission sprocket and a rear wheel and axle and a rear wheel sprocket and driving chain, an improved suspension system including:

a trunnion rotatably mounted on the rear wheel axle,

a swing arm pivotally mounted to each of the frame and trunnion,

a compensating lever pivotally mounted to each of the frame and on the trunnion,

means for guiding vertical movement of the rear wheel by effecting a pulling force upon the lower portion of the trunnion in an inboard direction toward the pivotal connection of the compensating lever and the frame with a resultant coincidence of the rear wheel axle in its traverse of a predetermined arc in coincidence with the arc of travel of the pivotal connection of the swing arm and trunnion.

4,061,051

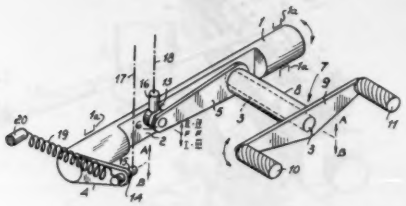
DEVICE FOR PEDAL OPERATING A MOTOR VEHICLE TRANSMISSION CONTROL

Ugolino Grandis, Via Bellavitis, 10/bis, Padova, Italy

Filed July 19, 1976, Ser. No. 706,643
Claims priority, application Italy, July 21, 1975, 41672/75
Int. Cl.[2] G05G 1/14, 9/16
U.S. Cl. 74—474 **4 Claims**

1. A device for pedal operating a motor vehicle transmission control, particularly for motorbikes equipped with an automotive type of transmission including speed selecting and engaging mechanisms, characterized in that it comprises: a shaped shaft supported in bearings adapted to permit a limited rotational oscillation thereof, a rigidly attached pin substantially perpendicular to said shaft, a lever partially engaged with said

pin and provided with an operative end substantially intersecting said shaped shaft rotation axis, one arm projecting rigidly from said shaft and having an operative terminating portion, a resilient bias means effective to make said shaft substantially stable at the oscillation extremes thereof, and a pedal set rigidly



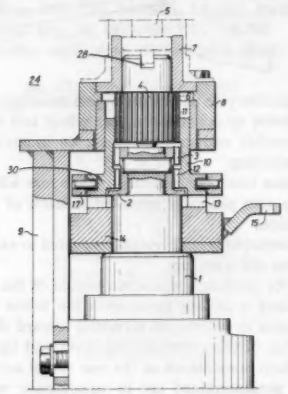
attached to said lever and adapted to permit both the rotation of said lever and the oscillation of said shaped shaft, said operative terminating portion and said operative end being repectively connected to said speed selecting mechanism and speed engaging mechanism.

4,061,052

DEVICE FOR SHIFTING BETWEEN FINE AND COARSE STEERING OF VEHICLES COMPRISING A FRONT AND A REAR VEHICLE PART

Eric Arnoldsson, Soderhamn, Sweden, assignor to Kockums Industri Aktiebolag, Soderhamn, Sweden

Filed Apr. 30, 1976, Ser. No. 682,011
Claims priority, application Sweden, May 6, 1975, 75052670
Int. Cl.[2] B62D *1/20*
U.S. Cl. 74—498 **16 Claims**



1. A device for shifting between fine and coarse steering operations for vehicles comprising front and rear vehicle parts articulately joined with each other, hydraulic steering cylinders disposed between said two vehicle parts for angularly displacing the vehicle parts relative to each other for accomplishing the steering of the vehicle, a first valve being adapted to control the fluid flow to the steering cylinders in order to provide for the fine steering of the vehicle, and a second valve being adapted to control the fluid flow to the steering cylinders to provide for the coarse steering, the improvement comprising:

a shifting means, which is shiftable between two positions and is adapted in a first position to connect an actuator, provided for the steering of the vehicle, to the first valve, and a second position to connect the actuator to the second valve,

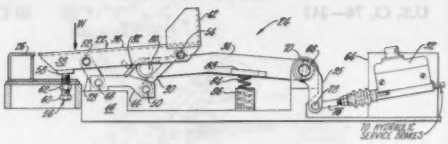
said shifting means and said valves being arranged so that with the shifting means in the first position, a mutual angular displacement of the vehicle parts is obtained which is proportional to the movement of the actuator, and with the shifting means in the second position, a continuous angular diaplacement of the vehicle parts is obtained as long as the actuator is moved from a predetermined initial position.

4,061,053

VEHICLE SERVICE BRAKE PEDAL

Derek K. Keene, and Walter R. Hinde, both of Philadelphia, Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 25, 1975, Ser. No. 607,179
Int. Cl. G05G *1/14*
U.S. Cl. 74—512 **10 Claims**



1. In a brake system for a vehicle including brake actuator means operable to apply a brake application force signal to the wheel brakes of said vehicle, said vehicle including a frame and an operator's station defined by said frame, said actuator means including an input member movable between a brake released position and a brake applied position: a pedal operatively mounted on said frame within said operator's station, means operatively connecting said pedal to said input member for moving said input member between said brake released position and said brake applied position, and linkage means supporting said pedal for movement between a brake released position and a brake applied position, said linkage means being effective to maintain said pedal in its brake released position when the effective force applied to said pedal is applied to a first region of said pedal and to permit movement of said pedal to its brake applied position when said effective force is applied to a second region of said pedal; said linkage means comprising a first link member having a first end pivotally mounted to the frame of said vehicle and a second end pivotally attached to said pedal at a first angle to the vertical with respect to said first end when said pedal is in said brake released position, and a second link member spaced forward of said first link member and having a first end pivotally attached to the frame of said vehicle and a second end pivotally attached to said pedal at a second angle to the vertical with respect to said first end when said pedal is in said brake released position, said second region of said pedal being located forward of said second end of the first link member.

4,061,054

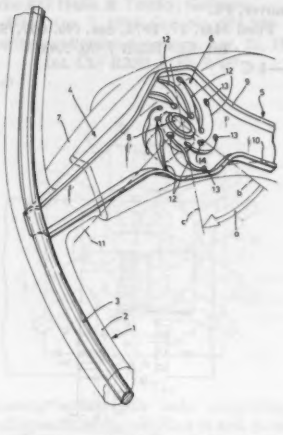
STEERING WHEEL

Josef Wenninger, Vorsfelde, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Germany

Filed July 9, 1976, Ser. No. 704,095
Claims priority, application Germany, July 9, 1975, 2530594
Int. Cl.[2] G05G *1/10*; B62D *1/18*
U.S. Cl. 74—552 **8 Claims**

1. A steering wheel comprising a hub having an axis, a rim, spokes interconnecting said hub with said rim, and a deformation member, interposed between said spokes and said hub and surrounding said hub, for permitting said steering wheel to tilt upon impact by a vehicle operator, said deformation member having the form of a flat plate having a plurality of lines of reduced strength on all sides of said hub, each of said lines

interconnecting first and second end points, said first end point for each line being at a different radial distance from said hub



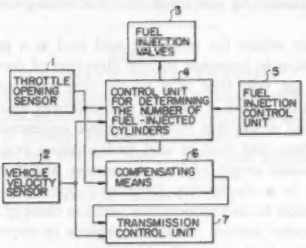
axis and at a different angle with respect to said hub axis than said second end point.

4,061,055

FUEL INJECTION CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE OF A VEHICLE

Haruhiko Iizuka; Junichiro Matsumoto, both of Yokosuka, and Fumiaki Kato, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 27, 1976, Ser. No. 718,189
Claims priority, application Japan, Aug. 28, 1975, 50-103474
Int. Cl.[2] B60K *41/18*; F02B *3/00, 77/00*
U.S. Cl. 74—866 **10 Claims**



1. A fuel injection control system for use with an electronic type of automatic transmission system for an internal combustion engine of a vehicle, said electronic automatic transmission system including a transmission control unit for generating a signal representative of a proper shifting of gears,

said fuel injection control system comprising in combination:

a plurality of injection means respectively provided at corresponding cylinders of the engine;

a first sensor for sensing the opening degree of a throttle to generate a signal representative thereof;

a second sensor for sensing vehicle velocity to generate a signal representative thereof, which second sensor is connected to said transmission control unit supplying the same with the signal;

a control unit connected to said first and said second sensor receiving the signals therefrom for determining the number of cylinders to which fuel is injected, and controlling said plurality of injection means connected thereto; and

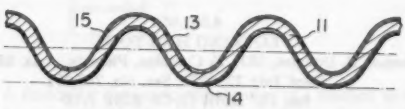
compensating means connected to said first sensor for receiving the signal therefrom and also connected to said control unit for receiving a signal representative of the number of the cylinders to which fuel is injected, and generating a signal representative of the opening degree of the throttle under the condition that fuel is injected to all of the cylinders, regardless of the number of the cylinders to which fuel is actually injected, said compensating means connected to said transmission control unit for supplying the same with the signal therefrom, whereby said transmission control unit determines the proper shifting of gear ratios based on the signals from said compensating means and said second sensor.

4,061,056

METHOD OF MAKING OUTER BLADES FOR ELECTRIC SHAVERS

Yoshimitsu Nakamura, Settsu, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Mar. 29, 1976, Ser. No. 671,581
Claims priority, application Japan, Apr. 3, 1975, 50-40859
Int. Cl.[2] B21K *11/00*
U.S. Cl. 76—104 R **9 Claims**



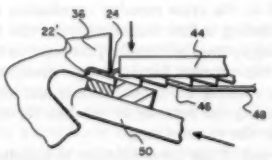
1. The method of making an outer blade for an electric shaver comprising the steps of forming a thin metal plate with a two-dimensional pattern of openings separated by lands so that each land is of arcuate section producing a smooth lower side having upwardly presented edges of metal extending in a direction away from the smooth side, grinding the upwardly presented edges to the same level to sharpen them accompanied by formation of fins which extend laterally from the lands into the adjacent openings, and then pressing the blade between a smooth layer of hard material on one side and a layer of resilient material on the other, the resilient material being on the finned side and the hard material being on the smooth side, so that the surface of the resilient material bulges locally through the individual openings to break off the fins with the result that each opening is bounded by clearly defined sharpened edges.

4,061,057

METHOD FOR ATTACHING CUTTING TIPS TO CUTTING TOOLS

Gorman D. Gray, Eagle Creek, Oreg., assignor to Lifetime Carbide Company, Colton, Oreg.

Division of Ser. No. 637,841, Dec. 5, 1975, abandoned. This application June 23, 1976, Ser. No. 699,165
Int. Cl.[2] B23D *63/00*
U.S. Cl. 76—112 **6 Claims**



1. A method of manufacturing cutting blades of the type having a series of spaced teeth formed therein and a respective pre-formed cutting tip attached to each tooth, each of said pre-formed cutting tips on said blades having a pre-formed contact surface attached to a respective tooth and a pre-formed

cutting edge separate from said contact surface oriented in an operative cutting position, said method of manufacturing said blades comprising:

a. prior to attaching said pre-formed cutting tips to said teeth of said blades, holding said respective pre-formed cutting tips in attached relation to one another in an adjoining series forming an elongate strip of said pre-formed cutting tips;

b. positioning the pre-formed contact surface of one of said cutting tips located on one end of said strip in close proximity with a tooth of a respective blade;

c. joining the pre-formed contact surface of said end cutting tip operatively to said tooth such that the pre-formed cutting edge of said end cutting tip is in said operative cutting position; and

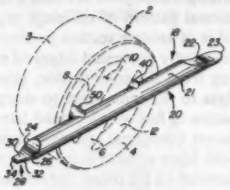
d. detaching said end cutting tip from the remainder of said elongate strip of pre-formed cutting tips.

4,061,058

LOCKING HUB TOOL

Thomas P. Douglas, 3531 E. Coolidge, Phoenix, Ariz. 85018

Filed July 22, 1976, Ser. No. 707,851
Int. Cl.² B25B *13/02*; B25F *1/00*
U.S. Cl. 81—90 C **4 Claims**



1. A combination tool for use with four wheel drive vehicle hubs having a pair of recesses separated by a web comprising, in combination:

handle means including a cross member having a top portion and a bottom portion and a side portion extending between the top portion and the bottom portion defining a handle and having a first end and a second end spaced apart axially from each other;

a pair of pins secured to and extending outwardly substantially perpendicular to the top portion and the bottom portion from the side portion of the cross member and spaced apart from each other and disposed substantially parallel to each other for respective insertion into the pair of recesses of the hub;

a first end on the cross member terminating at a first point and including a first recess adjacent the first point and extending upwardly from the first point to the top portion of the cross member for receiving a thumb or finger of the user for rotating the cross member and defining a scoop for cleaning the recesses of the hub for insertion of the pins into the recesses, and

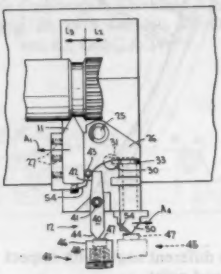
a second end of the cross member terminating at a second point and including a second recess adjacent the second point and extending upwardly from the second point to the top portion of the cross member for receiving a thumb or finger of the user for rotating the cross member and defining a blade for cleaning the recesses of the hub for insertion of the pins into the recesses.

4,061,059

UNDERCUTTER ATTACHMENT

Dale L. Keller, Gettysburg, Pa., assignor to Richard H. Sheppard, Hanover, Pa.

Filed Mar. 17, 1976, Ser. No. 667,798
Int. Cl.² B23B *1/00, 5/00*
U.S. Cl. 82—1 C **10 Claims**



1. An undercutter attachment for a machine tool for operating on a rotating workpiece in forming an undercut portion upon said workpiece relative to an enlarged diameter portion of said workpiece, comprising:

a base,

feed means for providing relative movement between said base and said workpiece,

a movable toolholder mounted on said base,

a tool carried by said toolholder for cutting said workpiece, and

actuator means for engaging said tool at a predetermined position in response to one direction of feed movement, moving said tool in a single step from an inoperative position which is clear of said enlarged diameter portion of said workpiece to an operative undercutting position, holding said tool in said undercutting position over an extended length of feed movement, and disengaging said tool in a single step from said operative undercutting position to said inoperative position clear of said enlarged diameter portion of said workpiece in response to return feeding in the opposite direction.

10. The method of undercutting a rotating workpiece on a machine tool in order to form an undercut portion upon said workpiece relative to an enlarged diameter portion of said workpiece comprising the steps of:

relatively feeding in one direction a cutting tool axially with respect to said workpiece,

maintaining said tool at an inoperative position out of the path of said workpiece so as to avoid cutting over an enlarged diameter length of said workpiece,

moving said tool in a single step from said inoperative position to an operative undercutting position against said workpiece after passing said enlarged diameter length in response to said movement,

continuing to feed said tool relative to said workpiece so as to provide an extended undercut,

relatively return feeding said workpiece and said tool in the opposite direction, and

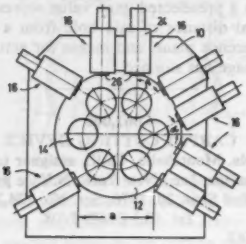
disengaging said tool in a single step from said operative undercutting position to said inoperative position during return feeding in response to said movement.

4,061,060

AUTOMATIC MULTISPINDLE TURNING LATHE

Günther Trautmann, Kirchheim-Nabern, Germany, assignor to Index-Werke KG Hahn & Tessky, Germany

Filed Apr. 7, 1976, Ser. No. 674,550
Claims priority, application Germany, Apr. 22, 1975, 2517759
Int. Cl.² B23B *3/30, 9/00*
U.S. Cl. 82—3 11 Claims



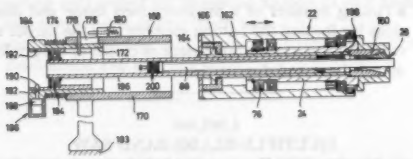
1. An automatic multispindle lathe comprising a bearing housing, a multispindle drum mounted in said housing with its axis and the axes of its spindles in parallel horizontal positions, a plurality of cross-carriage assemblies supported by said bearing housing in positions so as to be associated respectively with spindles of said drum, each cross-carriage assembly including a guide body and a cross-carriage with a longitudinal axis and guided for movement by said guide body along its longitudinal axis, the longitudinal axis of each cross-carriage being oriented to intersect the axis of its associated spindle, the front-end of each cross-carriage having a tool holder facing the associated spindle so that the direction of movement of the cross-carriage and its tool holder will intersect the axis of the associated spindle, two cross-carriage assemblies being operatively associated with at least one of said spindles with the longitudinal axes of the cross-carriages thereof being positioned relative to each other at an acute angle sufficient to enable their tool holders to be advanced simultaneously to the spindle.

4,061,061

AUTOMATIC TURRET LATHE

Heinrich Lahm, Esslingen-Sirnau, and Dieter Gutbrod, Aichwald-Aichschiess, both of Germany, assignors to Index-Werke KG Hahn & Tessky, Esslingen, Germany

Division of Ser. No. 691,347, June 1, 1976. This application Jan. 17, 1977, Ser. No. 760,109
Int. Cl.² B23B *13/00*
U.S. Cl. 82—2.5 7 Claims



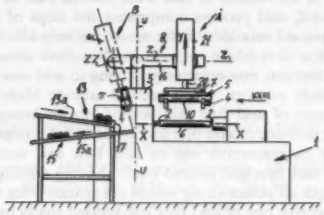
1. A lathe comprising a headstock, a live spindle supported in said headstock for rotational and axial movement, said live spindle being hollow and having a spindle head at its forward end for clampingly engaging bar stock extending through the hollow-spindle, clamp actuating means associated said spindle head for actuating said spindle heads for clamping and releasing said bar stock, and a bar stock feed and guide mechanism extending into said hollow-spindle from the rearward end thereof, said mechanism including a guide piece for the bar stock and a supporting member adapted to be mounted on the rearward end of the bar stock and supported in said guide piece, said support member and guide piece being operably coupled together so that the support member will move relative to said guide piece only during axial displacement in the feed direction of the live spindle when said spindle head is clamped onto said bar stock.

4,061,062

METHOD AND A DEVICE FOR THE AUTOMATIC REPLACEMENT OF A WORKPIECE TO BE MACHINED ON A MACHINE-TOOL

François Peltier, Ruelle, France, assignor to Moteurs Leroy-Somer, Angouleme, France

Filed Jan. 18, 1977, Ser. No. 760,375
Claims priority, application France, Jan. 29, 1976, 76.02394
Int. Cl.² B23B *13/00, 5/28;* B25J *3/00*
U.S. Cl. 82—2.7 21 Claims



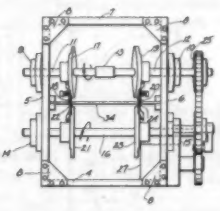
11. A device for automatic replacement of a finished workpiece by an unmachined workpiece on the work axis of a machine-tool or the like in which workpieces are clamped between centers, wherein said device comprises a frame for supporting an assembly of two superposed and rigidly associated cradles each capable of receiving a workpiece placed under the action of gravity and means for simultaneously displacing the two cradles both in height and transversely with respect to their axis in successive movements of translation which are inscribed in a plane at right angles to the work axis.

4,061,063

ROTARY SHEAR

John B. Brush, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 27, 1976, Ser. No. 754,421
Int. Cl.² B23D *19/06, 25/12*
U.S. Cl. 83—55 25 Claims



1. A rotary shear for making clean and complete cuts in a continuously moving web, said cuts being straight cuts parallel to the direction of movement of said web, straight cuts lying at an angle to the direction of movement of said web, curved cuts of combinations thereof, said shear comprising first and second rotatable shafts, a first blade support non-rotatively affixed on said first shaft, a first arcuate blade mounted on said first blade support, a second blade support non-rotatively affixed on said second shaft and a second arcuate blade mounted on said second blade support, one of said first and second blades being flexible and in part at least elastically mounted on its respective one of said first and second blade supports, said first and second blades comprising a cooperating pair of blades having

cutting edges of equal length all points along which are spaced from the axis of their respective one of said first and second shafts by the same radial distance, said blade cutting edges being configured to make the desired cuts through said web, the axes of said first and second shafts lying in parallel horizontal planes so spaced and in vertical planes which intersect at an angle such that said first and second blades are skewed with respect to each other at an angle of from about 1° to about 6° and will have single point cutting contact throughout the length of their cutting edges, and means to rotate said shafts in timed relationship so that said first and second blades will properly coact.

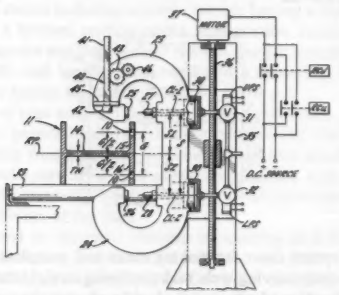
20. A process of making clean and complete cuts in a continuously moving web of thin, pliable, compliant, cut-resistant material, said cuts being straight cuts parallel to the direction of movement of said web, straight cuts lying at an angle to the direction of movement of said web, curved cuts or combinations thereof, said process comprising the steps of providing first and second rotatable shafts, non-rotatively affixing to said first shaft a first blade support with a first arcuate blade mounted thereon, non-rotatively affixing to said second shaft a second blade support with a second arcuate blade mounted thereon, one of said first and second blades being resilient, mounting said one of said first and second blades in part at least elastically its respective one of said first and second blade supports, said first and second blades having cutting edges of equal length all points along which are spaced from the axis of their respective one of said first and second shafts by the same radial distance, configuring said cutting edges of said first and second blades to make the desired cuts through said web, so spacing and so angling said axis of said first and second shafts that said first and second blades are skewed with respect to each other at an angle of from about 1° to about 6° and will have single point cutting contact throughout the length of their cutting edges and rotating said first and second shafts in timed relationship so that said first and second blades properly coact.

4,061,064

APPARATUS FOR FORMING HOLES IN THE FLANGES OF STRUCTURAL MEMBERS

Lee Kindgren, Rockford, and James P. Swanson, Winnebago, both of Ill., assignors to W. A. Whitney Corporation, Rockford, Ill.

Filed Dec. 1, 1976, Ser. No. 746,603
Int. Cl.² B26F *1/02*
U.S. Cl. 83—368 **23 Claims**



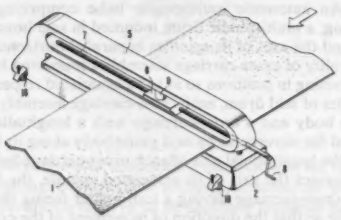
1. Apparatus for forming holes in the upright flange of an elongated structural member having a generally horizontal web joined to said flange, said apparatus comprising a generally vertically movable carriage, a tool mounted on said carriage and operable when actuated to form a hole in said flange, a probe movable vertically relative to said carriage, first mechanism selectively operable to move said probe from a first position spaced vertically from said web to a second position in contact with said web, a reversible counter, means responsive to movement of said probe for causing the count held by said counter to change by a value which is a function of the vertical distance traveled by said probe in moving from said first position to said second position, second mechanism automatically operable to move said carriage vertically after said probe has moved to said second position, said means being responsive to movement of said carriage for causing the count held by said counter to change by a value which is a function of the vertical distance traveled by said carriage, means for automatically stopping said carriage when the count held by said counter coincides with a preselected gage value representative of the desired vertical distance of said hole from a predetermined horizontal reference plane, and means for actuating said tool after said carriage has stopped.

4,061,065

CARPET CUTTING DEVICE

Baltazar Arriola, Montebello, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sept. 20, 1976, Ser. No. 724,297
Int. Cl.² B26D *5/08*
U.S. Cl. 83—562 **3 Claims**



1. A carpet cutting device for cutting a piece of carpet of predetermined shape and dimensions from a larger piece of carpet, said carpet cutting device comprising

an elongated base member having spaced opposite first and second substantially parallel surfaces;

a single elongated support member mounted on the base member in spaced substantially parallel relation with the first surface of the base member in a manner whereby a carpet is passable between the base and support members, said support member having an elongated externally threaded shaft extending along the length thereof;

carriage means threadedly coupled to the shaft of the support member and manually controllable by rotation of said shaft about its axis for positioning at a desired point on the support member; and

punch means mounted on the carriage means and including a cutting member of a predetermined shape and dimensions for forcing the cutting member into the carpet with sufficient force to cut out a piece of carpet of the predetermined shape and dimensions.

4,061,066

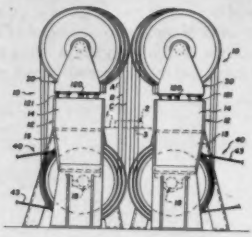
MULTIPLE-BLADE BAND SAW

Herold Mueller, 2377 Hayman Road, Kelowna, British Columbia, Canada

Filed Jan. 24, 1977, Ser. No. 762,040
Int. Cl.² B27B *15/08*
U.S. Cl. 83—808 **5 Claims**

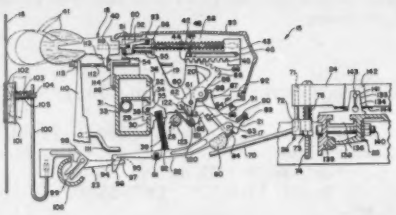
1. A multiple-blade band saw comprising a frame, a main shaft rotatably mounted on the frame; large intermediate and small driven wheels rotatably mounted on the main shaft for relative movement radially of said shaft; an idler wheel associated with each driven wheel, mounting means individually journalling the idler wheels upon the frame for relative movement laterally of said frame, an endless saw blade trained over each driven wheel and associated idler wheel, said saw blades providing parallel cutting runs normally radially spaced apart

with respect to the longitudinal axis of the main shaft, drive means for rotating one driven wheel, a drive train interconnecting said one and the other driven wheels to rotate all



driven wheels at substantially the same peripheral speed, and adjusting means for simultaneously shifting the relative positions of the driven and idler wheels whereby to selectively vary the radial spacing between the cutting runs.

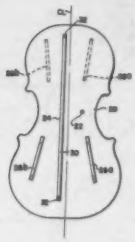
4,061,067
MODIFIED PIANO STRIKING MECHANISM
Jorge L. Carbone, 1544 Gottschall Road, Stow, Ohio 44224
Filed May 27, 1975, Ser. No. 581,026
Int. Cl.² G10C *3/18*
U.S. Cl. 84—236 **19 Claims**



1. A striking mechanism for use in pianos and related instruments having at least one string to produce a musical note and at least one key to select the musical note comprising:
- at least one hammer assembly for striking a string;
- an escapement action actuated by said key;
- a first lever engageable with said escapement action and said hammer assembly and interposed therebetween;
- coacting gear means for imparting motion to said hammer assembly from said first lever; and,
- means for supporting said hammer assembly, said escapement action and said first lever.

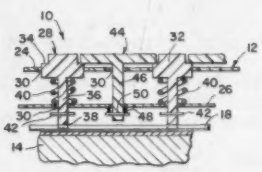
4,061,068
STRINGED INSTRUMENT WITH AN IMPROVED BACK PLATE CONSTRUCTION
Karl A. Stetson, R.F.D. 2, Box 182, South St., Coventry, Conn. 06238, and Carl Hugo Ågren, Saturnusvagen 86, 184 00 Akersberga, Sweden
Filed Dec. 17, 1975, Ser. No. 641,447
Int. Cl.² G10D *1/02*
U.S. Cl. 84—275 **10 Claims**

1. In a violin or the like, an improved back plate construction for the soundbox, characterized by:
- a substantially flat back plate having bracing means secured to its inner face,
- the bracing means comprising first and second lateral segments disposed in oppositely registering positions on opposed sides of a line of symmetry parallel to the longitudinal axia of the soundbox, and an elongated, longitudinal



brace secured to the inner face of the back plate and disposed substantially collinear to the axis of symmetry.

4,061,069
CHORD LOCATER FOR FRETTED MUSICAL INSTRUMENT
Art H. Brackett, 404 E. Walnut, Griggsville, Ill. 62340
Filed Oct. 13, 1976, Ser. No. 731,909
Int. Cl.² G10D *3/08*
U.S. Cl. 84—315 **7 Claims**

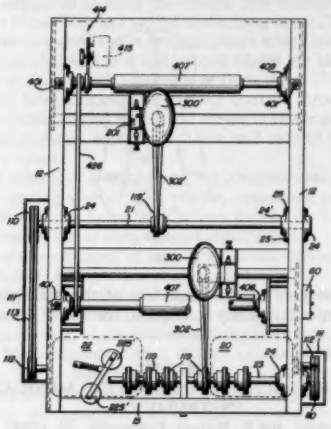


1. A chord locater adapted to be mounted on the neck of a stringed and fretted musical instrument comprising:
- a keyboard;
- a plurality of reciprocable buttons mounted on said keyboard in rows adjacent the frets of the musical instrument, each of said buttons having a shaft overlying one of the strings of the instrument; and
- a plurality of longitudinally extending reciprocable bar keys on said keyboard having opposite ends in contact with a button in adjacent ones of said rows of buttons on said keyboard.

4,061,070
CANT STRIP MACHINE
John L. Groves, 5260 N. Genessee Road, Flint, Mich. 48506
Filed Feb. 10, 1976, Ser. No. 656,889
Int. Cl.² B27B *5/04*; B27M *3/02*
U.S. Cl. 83—404.4 **13 Claims**

1. A cant strip sawing machine comprising; means for sawing multiple cant strips for use in the industrial roofing trade simultaneously including a strong support frame, means on said support frame for adjustably mounting two banks of saw blade assemblies, means provided for positively feeding material to be cut lengthwise into said banks of saw blade assemblies for the purpose of producing high speed cutting of a large number of cant strips simultaneously, the means for adjustably mounting the two banks of saw blade assemblies including a plurality of transverse bars across the width of the support frame, with each bank of saw blade assemblies having individual adjustments for each respective blade assembly associated with the transverse bars, and further including intermediate drive shafts appropriately supported on the said support frame together with adjustable means between each individual saw blade

assembly and the closest associated intermediate drive shaft for permitting accurate adjustments of the width of cant strips to



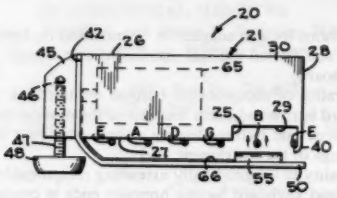
be cut as well as tension adjustments for the drive means for the saw blades.

4,061,071

STROBOSCOPIC TUNING DEVICE FOR MUSICAL INSTRUMENTS

Tucson Cameron, San Jose, Calif., assignor to Donald L. Cameron, Saratoga, Calif.

Filed May 6, 1976, Ser. No. 683,768
Int. Cl.[2] G10G 7/02
U.S. Cl. 84—455 **12 Claims**



1. A tuning device for a stringed instrument comprising:
a. a source of stroboscopic light;
b. means adapted to be supported by the stringed instrument in juxtaposed relation with the strings of said stringed instrument, said source of stroboscopic light being mounted on said means for supporting said source of stroboscopic light adjacent the strings of the stringed instrument; and
c. circuit means connected to said source of stroboscopic light for exciting said stroboscopic light at a preselected frequency.

4,061,072

DEVICE TO IDENTIFY CHORDS ON A KEYBOARD INSTRUMENT AND KEY MECHANISM FOR USE THEREWITH

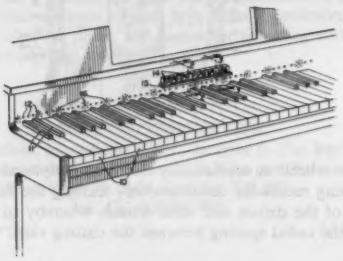
Juan M. del Castillo, Risco 119, Mexico 20, D. F., Mexico

Filed Feb. 10, 1976, Ser. No. 656,881
Int. Cl.[2] G09B 15/02
U.S. Cl. 84—478 **14 Claims**

1. A device for identifying chords on a keyboard musical instrument comprising

chord selection means including a plurality of operators having indicia associated therewith designating the chord names to be identified;

lighting means including lamp means and fiber optic means, said lamp means including a lamp for each note of said chords, said fiber optic means including a plurality of fiber optics for each of said lamps, one end of said plurality of fiber optics for each of said lamps being located adjacent that said lamp and the other end of said plurality of fiber



optics having individual ends of each of said fiber optics positioned adjacent a key of the keyboard in each of a plurality of octaves, having the same note name assigned to said lamp located at the opposite end of that said fiber optic;

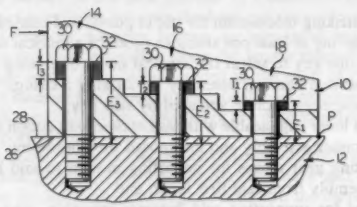
and electrical means responsive to actuation of each of said operators to light said lamps for notes comprising the chord designated by the chord name associated with each said operator.

4,061,073

CONTROLLABLY DEFORMABLE FASTENER ASSEMBLY

Rollen G. Easter, Tremont, and James A. Hooker, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 28, 1977, Ser. No. 763,740
Int. Cl.[2] F16B 31/02; B62D 25/06
U.S. Cl. 85—62 **16 Claims**



1. A controllably deformable fastener assembly, for securing a first member to a second member, comprising:

a fastener having a threaded shank portion, a head portion, and a shoulder portion on the head portion, said shank portion being of a material having a preselected tensile yield load;

clamping means including a shoulder portion for screw threadably receiving the shank portion of the fastener, moving the shoulder portion towards the shoulder portion of the fastener, and clamping the first and second members together; and,

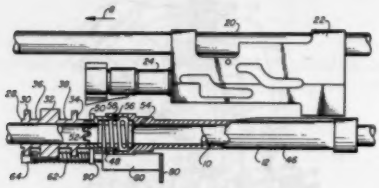
crushable element means disposed between one of the shoulder portions and one of the members for maintaining elastic deformation in response to threaded tightening of said fastener and controlled plastic deformation only in response to a force tending to separate said members at a preselected load which is less than said preselected tensile yield load of the shank portion of the fastener.

4,061,074

AMMUNITION FEED MECHANISM

Curtis D. Johnson, Davenport, Iowa; Larry C. McFarland, Silvis, Ill., and Lonnie D. Antwiler, Fenton, Mo., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 610,024, Sept. 3, 1975, Pat. No. 3,999,461. This application Aug. 23, 1976, Ser. No. 716,841
Int. Cl.[2] F41D 9/02
U.S. Cl. 89—33 CA 10 Claims



1. A belted ammunition feed mechanism for a gun having a bolt carrier, said mechanism comprising:

a rotatable sprocket,

said sprocket having first and second end rows of teeth between which rounds of ammunition may be cradled,

said sprocket having a center row of teeth both radially and axially longer than the teeth in said first and second end rows and extending between adjacent round connecting links to prevent their forward movement while associated rounds cradled between adjacent teeth are stripped forwardly and chambered by the bolt carrier on said gun,

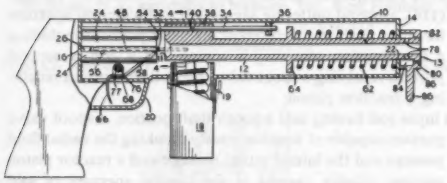
said center row of teeth having recesses between said adjacent teeth in which the cartridge encircling portions of said links are cradled.

4,061,075

AUTOMATIC WEAPON

Frank P. Smith, 164-04 33rd. Ave., Flushing, N.Y. 11358

Filed Oct. 7, 1976, Ser. No. 730,175
Int. Cl.[2] F41C 5/02
U.S. Cl. 89—132 8 Claims



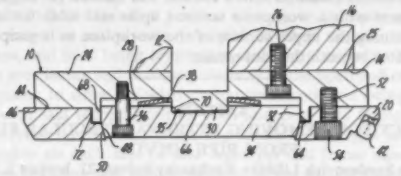
1. In a weapon: a receiver, a breech block fixed to said receiver, a barrel reciprocable within said receiver from a first position adjacent said breech block to a second position remote therefrom, spring means biasing said barrel towards said first position, trigger means associated with said receiver, a sear arm for holding said barrel in said second position, ejector guide means connected to said barrel and provided with means for engagement by said sear arm to hold said barrel in said second position, and gas cylinder chamber means externally of said barrel and in communication therewith, whereby upon firing of said weapon, the gases discharged from a cartridge ejected from said barrel, pass into said gas cylinder chamber means to thereby tension said spring means.

4,061,076

MILLING CUTTER

Donald A. Robertson, Union Lake, Mich., assignor to Indexomatic, Inc., Farmington, Mich.

Filed July 22, 1976, Ser. No. 707,884
Int. Cl.[2] B23C 5/26
U.S. Cl. 90—11 A 10 Claims



1. A milling tool comprising; an annular cutting tool, a support for said cutting tool including first and second members rotatable as a unit about a common axis, biasing means continuously urging said first and second members axially apart, said annular cutting tool being attachable to one of said members, means for attaching said cutting tool to said one of said members, the other of said members and said cutting tool including complementary annular guide surfaces engageable with each other to maintain said cutting tool concentric to said axis upon movement of said annular cutting tool relative to said one of said members.

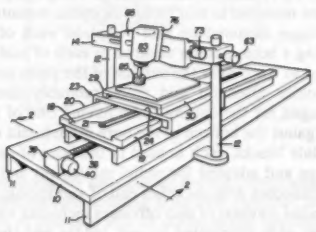
10. A milling tool comprising; a tool support including a first member adapted for connection to a rotatable drive member, a second member member connected to said first member for rotation therewith and axial movement relative thereto, a cutting tool attachable to said first member, said cutting tool and said second member including complementary guide surfaces in engagement with each other, biasing means urging said first and second members apart to maintain said guide surfaces continuously in engagement with each other to maintain said cutting tool concentric to said axis, and means connecting said tool to said first member against the action of said biasing means.

4,061,077

APPARATUS FOR FORMING LARGE COMPOUND CURVED SURFACES

Floyd R. Gladwin, 21000 E. River Road, Grosse Ile, Mich. 48138

Filed Jan. 6, 1977, Ser. No. 757,409
Int. Cl.[2] B23C 3/00
U.S. Cl. 90—15 A 10 Claims



1. Apparatus for forming a large radius, compound curve surface upon a large plate-like workpiece comprising:

an elongated bed having longitudinal opposite side edges, and said edges each being curved along a large radius, vertically axised arc, with the curved edges being parallel along their lengths;

a table supported upon the bed and spanning said curved side edges, and a guide strip mounted upon each side edge of the table and being curved complementary to its respective bed edge for engagement therewith;

said table being movable in a horizontal arcuate path longitudinally of the bed due to the engagement of the guide strips with the side edges;

power means mounted upon the bed and connected with the table for reciprocating the table along the bed, wherein a flat, large plate-like workpiece may be secured to the upper surface of the table for movement therewith;

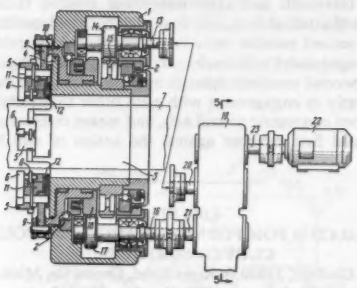
tool means mounted above the bed and located for engagement with a workpiece secured upon said table for machining the upper surface of the workpiece as it reciprocates beneath the tool means.

4,061,078

DEVICE FOR REMOVING EXTERNAL CIRCULAR FINS FROM PIPE JOINTS

Viktor Senderovich Lifshits, Kavkazsky bulvar, 21, korpus 2, kv. 41; Georgy Nikolaevich Petrov, Izmailovsky bulvar, 34/32, kv. 8; Oleg Sergeevich Papkov, Samarkandsky bulvar, 24, korpus 3, kv. 3; Vladimir Ivanovich Khomenko, ulitsa Miklukho-Maklaya, 39, korpus 2, kv. 372, all of Moscow; Alexandr Yakovlevich Gerasimenko, Sovetskaya ulitsa, 11/2, kv. 75, Elektrostal Moskovskoi oblasti; Alexandr Korneevich Taradaiko, ulitsa Mira, 30, kv. 27, Elektrostal Moskovskoi oblasti; Alexandr Mikhailovich Zemchenko, ulitsa Pushkina, 18, kv. 18, Elektrostal Moskovskoi oblasti, and Ivan Petrovich Gremyakov, ulitsa Lenina, 25, kv. 9, Elektrostal Moskovskoi oblasti, all of U.S.S.R.

Filed Feb. 19, 1976, Ser. No. 659,264
Int. Cl.² B23D *5/02*
U.S. Cl. 90—24 C **2 Claims**



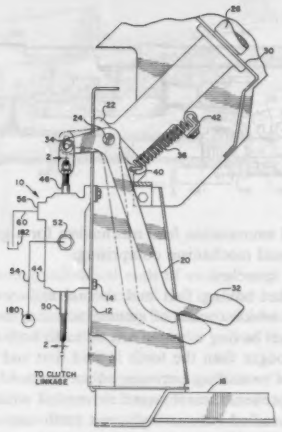
1. A device for removing external circular fins from pipe joints made by resistance butt welding, comprising: a base; a hollow rotor mounted in said base; a faceplate mounted on said rotor; carriages mounted on said faceplate, each of said carriages having a bore; a roller secured to each of said carriages and adapted to trace over the surface of the pipes under treatment; a holder fitted on said rotor rotatably therearound; springs gauged for the cutting force having one of their ends thrusting against the bottom of the bore in each said respective carriage; slide blocks, each housed in the bore of said respective carriage and adapted for radial movement and with one end interconnected with the other end of said spring; means for effecting radial traverse of said carriages including links having one of their ends articulated to said holder and the other of their ends articulated to said slide blocks; means for driving the rotor and the carriage radial traversing means including an output shaft of said driving means for driving the rotor and for actuating the carriage radial traversing means kinematically associated with said rotor; another output shaft of said driving means for driving the holder and for actuating the carriage radial traversing mechanism kinematically associated with said holder; said driving means further including means for control of the difference between the rotational speeds of said output shafts for driving the rotor and the carriage radial traversing means.

4,061,079

LOAD SENSING PULL-TYPE HYDRAULIC AMPLIFYING FLUID MOTOR

Harold R. Orth, Hinsdale, and William C. Swanson, Clarendon Hills, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed May 4, 1976, Ser. No. 683,105
Int. Cl.² F15B *9/10, 13/10*
U.S. Cl. 91—372 **6 Claims**



1. An amplifying fluid motor in communication with a source of fluid pressure for use in amplifying an input force to provide an output force in the direction of the input force of proportionally greater magnitude and further simultaneously providing a feedback force to the origin of the input force to indicate to the origin of the input force the proportional magnitude of the output force the amplifying fluid motor comprising:

a closed body having an inlet port in communication with the source of fluid pressure, a discharge port allowing the escape of spent fluid from said closed body, and a cylindrical chamber being surrounded by said closed body;

a power piston having a pressure side, a circumferential recess and a plurality of fluid passages including a radial fluid passage, a longitudinal passage, a lateral inlet passage (116), a lateral outlet passage (120) and a central aperture having a plurality of different diameter portions including a first portion receiving a spring and a cup, a second portion receiving a spool valve, and a third portion receiving a reaction piston;

an input rod having said smooth shaft portion, a spool valve portion capable of simultaneously blocking the radial fluid passage and the lateral outlet passage and a reactor piston portion slidably carried in the central aperture of said power piston;

an output rod having a smooth shaft portion and an enlarged portion restrained in the central aperture of said power piston;

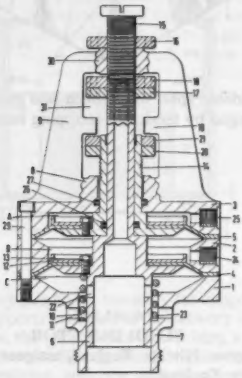
a power piston spring biasing the power piston to an extreme of its travel in the cylindrical chamber of said body;

an input rod spring constrained on said input rod tending to urge said input rod longitudinally, toward the said output rod whereby movement of said input rod will result in movement of said output rod through the displacement of said power piston by fluid being directed through said circumferential recess, said radial fluid passage, said lateral inlet passage, and said longitudinal passage to the pressure side of said power piston.

4,061,080
POSITION REGULATOR

Nils Eskil Sundstrom, Sodertalje, Sweden, assignor to AB Westin & Backlund, Stockholm, Sweden

Continuation-in-part of Ser. No. 605,294, Aug. 18, 1975, Pat. No. 3,978,884. This application June 21, 1976, Ser. No. 697,963
Claims priority, application Sweden, Mar. 3, 1976, 7602986
Int. Cl.² F01B *7/00*
U.S. Cl. 92—13.2 6 Claims

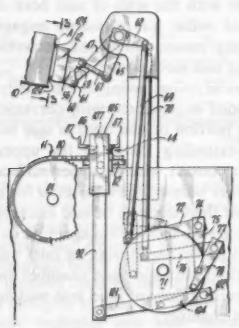


1. A position regulator comprising at least two pressure-transmitting elements (4, 5) which divide an internal space in said position regulator into a number of pressure chambers to which pressure medium is passed and from which pressure medium is conducted away in response to control means so as, via said pressure-transmitting elements (4, 5) to cause an output shaft (6) or the like displaceably mounted in said position regulator to adopt a number of axially determined positions in dependence upon individually adjustable stop means for respective pressure-transmitting elements, wherein said pressure-transmitting elements defining said pressure chambers comprise diaphragms (4, 5) or like means which are attached in mutually spaced relationship in said position regulator and which, when subjected to a force, permit axial displacement movements.

4,061,081
MACHINE FOR ERECTING FOLDED CARTONS

Albert A. Pinto, White Plains, N.Y., and Alexander J. Stanley, Milltown, N.J., assignors to Nabisco, Inc., East Hanover, N.J.

Filed Apr. 7, 1976, Ser. No. 674,375
Int. Cl.² B31B *1/76*
U.S. Cl. 93—53 SD 3 Claims

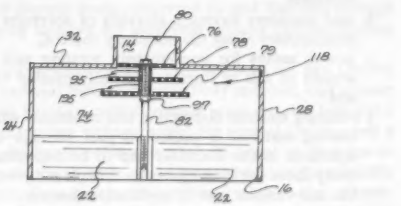


1. Apparatus for erecting folded cartons having first and second parallel panels comprising a magazine having an open end for storing flat folded and glued cartons, a vacuum head having a vacuum port area for engaging the major portion of said first panel, first vacuum exhauster means connected to said head for drawing air through said port at a low pressure of about 3 pounds per square inch and high flow rate of about 60 cubic feet per minute, means for conveying erected cartons to a loading station including an endless conveyor and a plurality of upwardly facing "U" shaped buckets, means for moving said head between a first position adjacent to the open end of said magazine and a second position adjacent said conveying means, said head being oriented in said first position with said port area facing and in close proximity to the open end of said magazine to draw a folded carton therefrom and being oriented in said second position with said port area facing said conveying means, carton opening means including a suction assembly on each side of said conveyor and frame members interconnecting said suction assemblies, the suction assemblies each including a pair of suction cups spaced along an edge of said conveyor and facing said head in said second position for engaging said second panel to grip said second panel at four widely spaced points, said suction cups engaging a total area on said second panel which is a minor portion of said second panel, second vacuum pump means connected to said opening means for drawing air through said suction cups at a high pressure of about 12 pounds per square inch and low flow rate of about 2 cubic feet per minute at each suction cup, means for moving said opening means toward said head in said second position to allow said suction cups to grip the folded carton carried by said head and moving said opening means away from said head to open said carton and place it in one of said buckets, and cam means for moving said suction assemblies along the longitudinal axis of said conveyor as they are moved between said head and said conveying means to aid in opening the carton, said cam means including a stationary vertically oriented cam track member on each side of said conveyor and a cam follower mounted on each of said suction assemblies.

4,061,082
VENTILATING AIR FILTERING AND DISTRIBUTING DEVICE

Bernard R. Shuler, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Oct. 20, 1975, Ser. No. 623,608
Int. Cl.² F24F *13/06*; B01D *31/00*
U.S. Cl. 98—40 D 15 Claims



1. A ventilating air distributing device comprising:
a plenum structure defining a plenum chamber and having an inlet in one face and an outlet in the opposite face;
damper-diffuser support means attached to said plenum structures proximate said outlet therefrom;
an adjustment rod mounted to said support means and coaxially disposed relative to and extending axially toward said inlet for selective axial movement toward and away from said inlet;
at least two parallel spaced apart mutually coaxially disposed perforated plates coaxially disposed on and attached to the rod proximate the end of said rod closest to said inlet for movement toward and away from said inlet with said rod;
said perforated plate farthest from said plenum structure

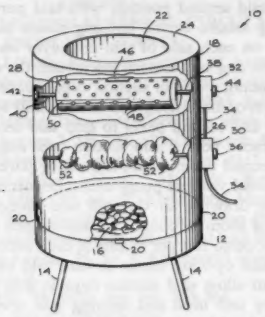
inlet is larger in area than said perforated plate closet to said plenum structure inlet, and said damper-diffuser support means comprises a beam attached at its opposite ends to the side walls of said plenum structure and extends across said outlet.

4,061,083

AUTOMATIC FOOD ROASTING AND BASTING DEVICE

John Caliva, 9250 Sepulveda Blvd., Sepulveda, Calif. 91343

Filed Sept. 8, 1975, Ser. No. 611,315
Int. Cl.[2] A47J 37/04
U.S. Cl. 99—345 6 Claims



1. An improved automatic food roasting and basting device comprising, in combination:

a. roasting means, including a fire box,

b. a support member secured to and extending above said fire box,

c. a roasting spit rotatably secured to said support member,

d. a basting unit rotatably secured to said support member, above said spit,

e. said basting unit and said roasting spit each having an axis of rotation lying in a common plane which is substantially perpendicular to the plane in which the fire box lies,

f. connector means interconnecting the roasting spit and the basting unit to enable pre-selected, synchronized rotation of said roasting spit and said basting container,

g. said basting unit comprising a tubular, hollow basting container,

h. said container having a plurality of apertures extending continuously along the periphery thereof,

i. power means for continuously rotating said container around an axis of rotation generally parallel to said spit, and

j. a basting material disposed in said container, whereby said basting material is caused to pass through continuous apertures in the container and to be deposited continuously about the rotating item in the spit at a pre-determinable and variable rate of application thereon.

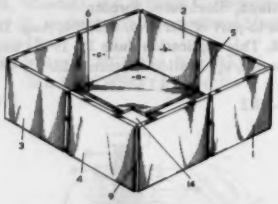
4,061,084

DEVICE FOR TRANSPORTING UNSTABLE STACKS OF SHEETLIKE MATERIALS

Hans Adolf Bakkeren, Barneveldseweg 89, Nijkerk, Netherlands

Filed Dec. 10, 1974, Ser. No. 531,359
Claims priority, application Netherlands, Dec. 11, 1973, 7316943
Int. Cl.[2] B65B 13/18
U.S. Cl. 100—1 4 Claims

1. An apparatus for stabilizing an unstable stack of sheet material to facilitate the transportation thereof, which apparatus comprises a plurality of releasably interconnected support members disposed to engage respective sides of the stack over the height thereof to constrain the sheet material against edgewise slippage, said support members being positioned to provide gaps for passing strapping material about the stack, said support members having confronting inclined edge surfaces



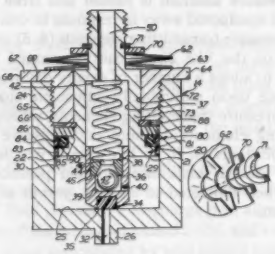
that are spreadable apart to establish said gaps when said surfaces are engaged by tensioned strapping material.

4,061,085

FLUID INJECTOR

Harold F. Farrow, Hitchin, England, assignor to Colorflo Limited, Hitchin, England

Filed July 6, 1976, Ser. No. 702,492
Int. Cl.[2] B41F 1/40
U.S. Cl. 101—150 7 Claims



1. A fluid injector unit for delivering a charge of fluid under pressure onto a substrate comprising

a housing having a bore therein defining a fluid chamber and an outlet passage in fluid communication with said fluid chamber,

a unitary assembly means including a main piston slidably engagable with the wall of said bore of said housing, a cylindrical collar for releasably engaging said housing, and biasing means interposed between said cylindrical collar and said main piston,

said cylindrical collar having an externally threaded surface for threaded engagement with corresponding threads on an upper portion of said bore in said housing, an annular laterally-extending flange at the upper portion of said collar for contact with an upper surface of said housing, and an inner bore within said collar for guiding reciprocal movement therethrough of said main piston, and

an auxiliary piston slidably engagable in an inner bore within said main piston and having an inlet valve for permitting flow of fluid into said fluid chamber and an outlet valve for controlling flow of fluid into said outlet passage from said fluid chamber,

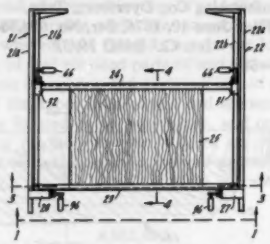
said unitary assembly means being removable from said housing as a unit without disassembly of said biasing means from said main piston or said cylindrical collar.

4,061,086

AUXILIARY PILE BOARD ASSEMBLY FOR PRINTING PRESSES

Friedrich Preuss, Sprendlingen, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG., Germany

Filed June 7, 1976, Ser. No. 693,683
Claims priority, application Germany, July 6, 1975, 2525499
Int. Cl.[2] B41F *13/64*
U.S. Cl. 101—240 4 Claims



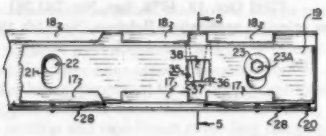
1. In an auxiliary pile board assembly for temporary occupation of spaced supports provided at the delivery end of a sheet-fed printing press, the combination comprising a pair of longitudinal rails of substantially equal length spaced parallel to one another for registering with the spaced supports, first and second cross rails of equal length, the first cross rail extending perpendicularly between corresponding ends of the longitudinal rails and secured to the latter, the second cross rail extending between the longitudinal rails parallel to the first cross rail, an auxiliary pile board of limited dimension interposed between and supported upon the cross rails, the longitudinal rails having longitudinally extending way surfaces thereon, the ends of the second cross rail being slidable on the way surfaces for purposes of lateral adjustment, the ends of the second cross rail having respective clamping members for applying pressure against the way surfaces, and means for tightening such members against the way surfaces for immobilizing the second cross rail in adjusted position with respect to the first cross rail for individual accommodation of a number of different pile boards of limited dimension proportioned to the size of the sheets being delivered by the press.

4,061,087

PLATE LOCKING STRUCTURE FOR PRESS CYLINDERS

George B. Hill, Salt Lake City, Utah, assignor to Newspaper Equipment Company, Salt Lake City, Utah

Filed Dec. 17, 1976, Ser. No. 751,276
Int. Cl.[2] B41F *27/06*
U.S. Cl. 101—415.1 13 Claims



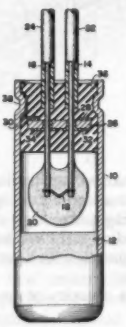
1. A structure for releasably securing an edge of a printing plate to a press cylinder over a saddle between the opposite edges of the saddle which are parallel to the longitudinal axis of the cylinder thereof, said structure being entirely contained in the region between said edges and including, in combination: an elongate base member constructed for securement to said press cylinder; an elongate locking bar aligned with, disposed over, and slideably engaging said base member and constructed for translational movement transverse to its elongate dimension with respect to said base member, said elongate locking bar having securement means for releasably retentively engaging said printing plate, said base member and said locking bar being provided with first, mutually cooperable, releasable detent means mutually engaged when said locking bar is moved in a first direction with respect to said base member to effect release of said printing plate; and spring means for slidably moving said locking bar in an opposite direction, to effect plate lock-up mounting, when said first detent means means are disengaged, said detent means and said spring means being wholly contained within said structure.

4,061,088

ELECTRIC DETONATING FUSE ASSEMBLY

Masahiro Ueda, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 9, 1976, Ser. No. 694,080
Claims priority, application Japan, Nov. 13, 1975, 50-136685
Int. Cl.[2] F42B *3/18*
U.S. Cl. 102—28 R 5 Claims



1. An electric detonating fuse assembly, comprising:

a metallic tubular body member having therein an igniting charge and an explosive charge, said body having a closed bottom end and an open neck portion;

a plug member provided in said neck portion of said body member for hermetically sealing sadi body member;

a filament disposed in the vicinity of said igniting charge;

a pair of electric leads connected to said filament through said plug member for supplying igniting current thereto; and

a non-linear resistor element disposed between said electric leads and said metallic tubular body member, said resistor element having a critical voltage point selected between a normal igniting voltage preset for normal ignition and a spark discharge voltage causing abnormal ignition due to accumulation of static electricty produced in the assembly whereby the resistor element shows a high value of resistance when applying thereto voltages smaller than said critical voltage, and a low value of resistance when voltages greater than said critical voltage are applied thereto, said non-linear resistor comprising:

a disc-shaped non-linear resistor having first and second sides and having said pair of electric leads extending therethrough;

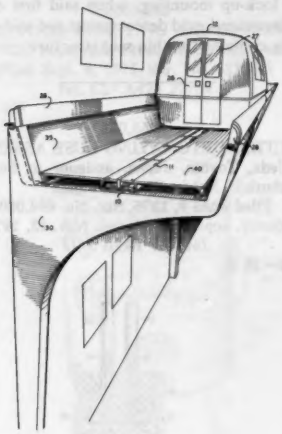
a pair of semi-circular shaped first and second electrodes provided on said first side of said non-linear resistor and electrically coupled to a one of said electric leads; and

a circular third electrode provided on said second side of said disc-shaped non-linear resistor, said circular third electrode being configured such that it is not in contact with said pair of electric leads, said circular third electrode further being electrically coupled to said tubular body member.

4,061,089
PERSONAL RAPID TRANSIT SYSTEM

Elbert Morgan Sawyer, Box 30602, Santa Barbara, Calif. 93105

Filed Sept. 2, 1975, Ser. No. 609,787
Int. Cl.[2] B61B *13/08*
U.S. Cl. 104—23 FS 35 Claims

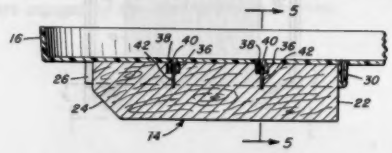


1. In a transportation system having an electrically propelled vehicle, means for controlling the speed and direction of said vehicle and propelling said vehicle comprising in combination:
a guideway including main line segments as well as ON and OFF ramp segments, which permit stations to be accessed by said vehicle;
said vehicle has a capacity of approximately 4 to 6 passengers:
support means comprising air bearings mounted on the bottom of said vehicle;
lateral support means on sides of said vehicle; said means reacting against side walls of said guideway to provide lateral guidance;
propulsion means comprising a linear synchronous motor having a primary portion of said motor embedded in the surface of said guideway;
said primary portion of said linear synchronous motor comprising segments having lengths equal to approximately half the longitudinal dimension of said vehicle;
said linear synchronous motor primary segment ends are placed in juxtaposition with each other minimizing the size of cooperating secondary members;
said linear synchronous motor having a primary winding which is excited by polyphase electric power in conjunction with an electronic control, which is adapted to apply said polyphase power on said linear synchronous motor primary segment when said vehicle passes into proper position above said segment and triggers a sensor, which detects when said vehicle is in proper position above said linear synchronous motor primary segment;
said linear synchronous motor also including field structure of the permanent magnet type which is mounted on the bottom of said vehicle; linear induction motor secondary segments mounted one on each side near said bottom of said vehicle to perform, in cooperation with primary segments mounted in guideway sides to achieve:
acceleration of said vehicle to guideway synchronous speed;
steering direction of said vehicle at points in said guideway where the guideway main line has a break in one wall to form another choice of route of travel;
dynamically braking vehicles at station stops;
a means of reducing hunting of said linear synchronous motor;
a means of generating auxiliary electrical power inside said vehicle by using a portion of the tractive effort which propels said vehicle; said means uses only variations in magnetic field intensity; said variations in magnetic field intensity caused by changes in reluctance of magnetic circuit produced by linear motion of said vehicle.

4,061,090
PLASTIC PALLET

Floyd Raymond Callon, Cincinnati, Ohio, assignor to Heckethorn Manufacturing Co., Dyersburg, Tenn.

Filed June 10, 1976, Ser. No. 694,584
Int. Cl.[2] B65D *19/32*
U.S. Cl. 108—51.1 15 Claims



1. A pallet comprising a one-piece molded plastic platform having a planar upper load-receiving surface and a lower surface, a plurality of elongated wood skids underlying and engaged with selected portions of the lower surface of the plastic platform, said skids being in laterally spaced generally parallel relation to each other and presenting floor engaging, unencumbered planar bottom surfaces, the skids defining sliding supports for said platform of a height and spaced for the accommodation of lift equipment below said platform, and means for fixing the wood skids to the lower surface of said platform, said means for fixing the skids to the platform comprising upwardly opening notches transversely across the upper portions of the wood skids, integral hollow ribs depending from the corresponding selected portions of the lower surface of the platform and completely received within each said skid notch, each rib being elongated and substantially coextensive with the corresponding notch, fasteners engaged through said notch-received ribs and into the skids, the selected portions of the lower surface of the platform, other than said ribs, presenting planar surfaces coextensive with and engaged flat against the tops of the skids said molded plastic platform being capable of slight flexure so as to comform to a superimposed load upon the application of banding straps about the platform and load.

4,061,091
EXTENSIBLE TABLE

Edward C. Goyvaerts, Wilrijk, Belgium, assignor to N. V. Joseph Mertens International, Mortsel, Belgium

Filed Oct. 18, 1976, Ser. No. 733,281
Claims priority, application Belgium, Nov. 10, 1975, 254651
Int. Cl.[2] A47B *1/02*
U.S. Cl. 108—84 1 Claim

1. An extensible table construction including in combination:
a table frame having hollow side members each with two spaced vertical guide slots and with a horizontal guide slot in their inner surfaces;
two table end sections slidably mounted between said side members;
a vertically movable central leaf having two outwardly directed first protrusions on each of its sides, said protru-

sions being engaged in said vertical guide slots of said side members;

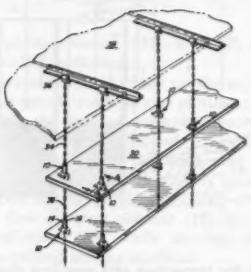
a pair of operating slides slidably mounted in respective ones of said side members and having at the location of each of said first protrusions thereof an elevated portion with two upwardly converging sides and a horizontal top part, said slide having at its one end a second protrusion engaged in said horizontal slot of the side member wherein the slide is slidably mounted;

a pair of springs each attached between said frame and another end of a respective one of said slides, said springs continuously urging said slides towards their operative position wherein said first protrusions are located on the top parts of said elevated parts of said slides, said second protrusions occupying end positions in said second guide slots and the upper faces of said end sections and of said leaf being located in the same plane, said operative position being reached when said slides are released to be displaced by said springs when said central leaf is lifted upwardly.

4,061,092
SUSPENDED SHELF BRACKET

Arnold Ralph Jacobsen, Arlington Heights, and I. Pompe Jaffe, Skokie, both of Ill., assignors to Skyhook Sales Corporation, Niles, Ill.

Filed July 29, 1976, Ser. No. 709,808
Int. Cl.² C08B 1/00
U.S. Cl. 108—149 **4 Claims**



1. A bracket adapted for the support and suspension of a plurality of shelf platforms comprising

a support member formed by an upwardly extending rib portion forming one end of said support member and a lower extending flange portion forming the lower portion thereof,

said upwardly extending rib having a width dimension less than one-half of the width dimension of said lower extending flange portion and being positionally carried at the approximate midposition of said lower flange portion,

each of said upwardly extending rib and lower extending flange portions provided with apertures formed therein adjacent the outer ends thereof respectively,

said bracket being completed by support means mounted on said support member intermediate said upwardly extending rib portion and said lower extending flange portion,

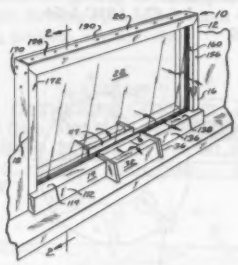
said support means formed by a pair of support fingers extending laterally outwardly and in normal relation with respect to said rib and flange portions respectively,

whereby a plurality of said shelf brackets may be employed to freely suspend a shelf platform by inserting said rib portion of said shelf bracket through an aperture provided in the shelf platform until the lower surface of the shelf platform is supported by said support means extending laterally outwardly from the support member, and said upper and lower apertures provided in said rib portion and flange portion respectively accommodating the insertion therein of a suspension cable whereby the cable extending upwardly from said rib portion interconnects with the support structure positioned thereabove while the cable extending from the aperture in said flange portion downwardly supports the next freely suspended shelf platform therebelow.

4,061,093
TELLER PROTECTION UNIT

Bernard A. Carstens, Jr., Cedar Lake, Ind., and Robert L. Carstens, Palos Heights, Ill., assignors to Chicago Bullet Proof Equipment Company, Park Forest, Ill.

Filed Apr. 12, 1976, Ser. No. 675,720
Int. Cl.² E05G 7/00
U.S. Cl. 109—19 **4 Claims**



1. A teller protection unit comprising: a first channel base; a second channel base positioned adjacent to said first channel base; a first plurality of Z-clips connected to said first channel base; a second plurality of Z-clips connected to said second channel base; a first center channel connected to said first plurality of Z-clips, said first center channel and said first channel base defining a portion of a bottom sound path; a second center channel connected to said second plurality of Z-clips, said second center channel and said second channel base defining another portion of a bottom sound path; a first pair of rubber bearing pads connected to said first center channel; a second pair of rubber bearing pads connected to said second center channel; a frustum-shaped deal tray connected to said first and second channel bases between said first and second center channels, said frustum-shaped deal tray being adapted to allow transmission of goods and sound through said frustum-shaped deal tray; a piece of laminated bullet-resistant glass engaging said first pair and second pair of rubber bearing pads and said tray channel, a first jamb channel connected perpendicular to said first channel base, said first jamb channel having a first pair of rubber acoustical spacers connected thereto, said first jamb channel being positioned in spaced proximity to a first vertical edge of said piece of laminated bullet-resistant glass, said first pair of rubber acoustical spacers resiliently engaging said first vertical edge of said piece of laminated bullet-resistant glass, said first jamb channel and said first vertical edge of said piece of laminated bullet-resistant glass defining a first side sound path; a second jamb channel connected perpendicular to said second channel base, said second jamb channel having a second pair of rubber acoustical spacers connected thereto, said second jamb channel being positioned in spaced proximity to a second vertical edge of said piece of laminated bullet-resistant glass, said second pair of rubber acoustical spacers resiliently engaging said second vertical edge of said piece of laminated bullet-resistant glass, said second jamb channel and said second vertical edge of said piece of laminated bullet-resistant glass defining a second side sound path; a back header bar connected between and perpendicular to said first and second jamb channels; a spacing bar connected to said back header bar; an angle bracket connected to said spacing bar; and a front header bar connected between and perpendicular to said first and second jamb channels, said back header bar, said spacing bar, said angle bracket, said front header bar being positioned in spaced proximity from a top

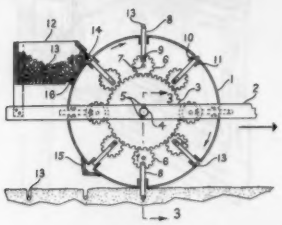
edge of said piece of laminated bullet-resistant glass, said back header bar, said spacing bar, said angle bracket, said fron header bar and said top edge of said piece of laminated bullet-resistant glass defining a top sound path; said bottom sound path, said side sound paths and said top sound path providing balanced and natural sound transmission around said piece of laminated bullet-resistant glass.

4,061,094

MAGNETIC SEED DELIVERY AUTODIBBLE PLANTER

John W. Cary, and William H. Heinemann, Jr., both of Kimberly, Idaho, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 19, 1976, Ser. No. 715,676
Int. Cl.² A01C *5/04*
U.S. Cl. 111—89 **4 Claims**



1. A device for planting seeds, comprising in combination -
a. a frame,
b. a fixed gear mounted on said frame,
c. a wheel with a concave rim rotatably mounted on said gear and having an axis of rotation passing through the center of said fixed gear, the rim of said wheel containing a plurality of slots located at the deepest point therein,
d. a plurality of drive gears rotatably mounted on said wheel and planetarily arranged around and communicating with said fixed gear, each drive gear equipped with a punch pivotally mounted thereon and cooperating with said wheel and said fixed gear such that the rotation of said wheel causes the punches to move in and out of the wheel through the slots therein and such that the punches are fully extended when they are perpendicular to and when they are parallel to the soil surface and fully retracted when they are at points midway between perpendicular and parallel, each of said punches containing a magnetic tip, and
e. a seed box, filled with seeds coated with a magnetic attracting substance, mounted on said frame at a position which allows distribution of the seeds to said punches.

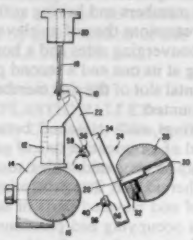
4,061,095

MEANS FOR MOUNTING TUFTING MACHINE HOOKS AND KNIVES

Herbert Benjamin Price, Chattanooga, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Sept. 29, 1976, Ser. No. 727,829
Int. Cl.² D05C *15/24*
U.S. Cl. 112—79 R **5 Claims**

1. A knife block for a tufting machine supporting a multiplicity of laterally spaced knives each having a substantially rectangular body including two opposite longitudinal edges extending between two opposite faces terminating at a cutting surface at one end, said knife block comprising an elongated body member having a multiplicity of holes formed in a face thereof, a knife supporting peg having a shank received in each hole and extending from said face, at least a portion of the peg extending from the hole comprising a central web of reduced thickness from that of the shank, the width of said webs being substantially no greater than that of said shank, a seat formed in the shank at each side of the web, a knife edge positioned in each seat with a face abutting the web, a cap positioned on the



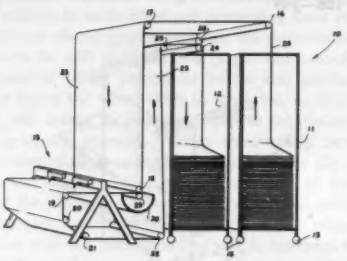
web and the other edge of each knife, and means for drawing said cap into locking engagement with said knives to secure the knives to the block.

4,061,096

QUILTED MATERIAL MENDING SYSTEM

Norman E. Elsas, Atlanta, Ga., assignor to Louisville Bedding Company, Louisville, Ky.

Filed July 9, 1976, Ser. No. 703,950
Int. Cl.² D05B *11/00*
U.S. Cl. 112—121.14 **12 Claims**



7. Apparatus for inspecting and mending elongated quilted webs or the like comprising a sewing station, means for moving a web in one direction along its length at a high speed first in a downward direction from a level higher than the sewing station toward the level of the sewing station and then laterally through said sewing station and for moving the web in the reverse direction along its length at a slower speed back through the sewing station, track means extending across the direction of movement of the web, sewing means positioned at said sewing station for sewing through the web, said sewing means comprising at least two sewing heads and stitch locking assemblies mounted on said track means, means for operating one of said sewing heads and stitch locking means in unison, and winch means connected to said sewing means for moving said sewing means along said track back and forth across the length of the web.

4,061,097

UNIT FOR AUTOMATICALLY SEWING THE OPPOSITE EDGES OF PIECE OF FABRIC

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Sept. 29, 1976, Ser. No. 727,877
Claims priority, application Italy, Oct. 3, 1975, 27915/75
Int. Cl.² D05B *21/00*
U.S. Cl. 112—121.15 **2 Claims**

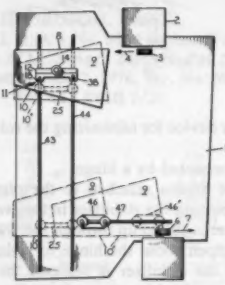
1. A sewing unit for stitching opposite non-parallel edges of a workpiece of the type having a work bed plate on which first and second sewing machines with their respective feeding

mechanisms are mounted in spaced relation, the improvement comprising: a device for transferring the workpiece after completion of stitching one edge thereof by the first sewing machine to the second sewing machine, said device including;

a. a pressure plate (12) mounted on the sewing unit for vertical movement toward and away from the work bed plate;

b. a retaining element (38) attached to said pressure plate (12) for engaging and retaining the workpiece after stitching by the first sewing machine;

c. rotation means defining a first drawing element (17) operatively connected to the work bed plate for vertical and horizontal movement to engage and pivot the unstitched edge of the workpiece on said retaining element (38) into alignment with the second sewing machine;



d. a position plotting element (31) carried by said first drawing element (17) including;

i. a checking element (36) fixed on the work bed plate in operative association with said plotting element (31) for controlling the limit of workpiece movement by said first drawing element (17); and

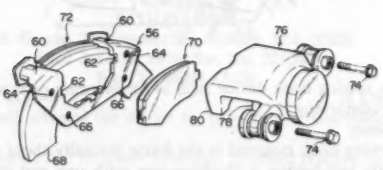
e. a second drawing element (21) connected in spaced relation to said first drawing element (17) for movement in a vertical plane to engage the workpiece and horizontally with said first drawing element (17) for releasing said retaining element (38) while moving the workpiece toward the second sewing machine.

4,061,098

PROCESS FOR BENDING METAL SHEET

Koji Horie, Toyota, and Takashi Mune, Anjo, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Hosei Brake Industry Company, both of, Japan

Filed Feb. 17, 1977, Ser. No. 769,429
Claims priority, application Japan, Aug. 27, 1976, 51-101715
Int. Cl.² B21C *37/02*
U.S. Cl. 113—116 Q **6 Claims**



1. A process for bending a metal sheet in manufacture of a torque bearing member for a disc brake, comprising the steps of:

bending a metal sheet through an angle approximating a right angle, with an inner bend radius being greater than the thickness of said metal sheet; and

further bending the bent portion of said metal sheet by using a press through a right angle, with an inner bend radius being less than the thickness of said metal sheet, and with the opposite side-edges of said metal sheet being held fixedly,

said formed disc brake torque bearing member thus shaped to form part of an assembly including, an inner pad and an outer pad arranged on the opposite sides of a brake disc having a rotary shaft, and a caliper for urging said pads against said brake disc, and

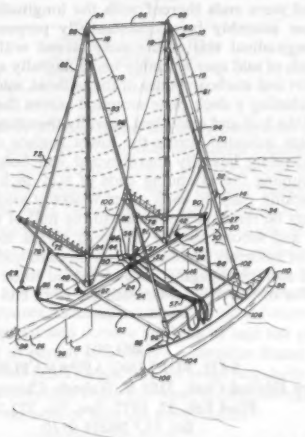
said torque bearing member formed to include: a 'U' shaped fixing or body portion extending along one side surface of said brake disc towards the peripheral edge of said disc; and opposite side-portions extending from the opposite sides of said fixing portion over the peripheral edge of said disc transversely outwardly and provided with a pair of guide portions for guiding an outer pad slidingly, said fixing portion forming right angled bends with said outer pad guiding portions, respectively.

4,061,099

OUTRIGGER SAILBOAT

Gregory Edward Cook, 3101 South Wabash, Chicago, Ill. 60616

Filed Feb. 23, 1977, Ser. No. 771,188
Int. Cl.² B63H *9/00*
U.S. Cl. 114—39 **1 Claim**



1. An outrigger sailboat comprising: an elongated drive outrigger hull having a length at least 20 times a width of said elongated drive outrigger hull, said elongated drive outrigger hull having a pair of identical wave cutting bows, said identical wave cutting bows being positioned at opposite ends of said elongated drive outrigger hull; a pair of rotatable keels rotatably connected to said elongated drive outrigger hull, said rotatable keels being rotatable in opposite directions to provide directional control to said elongated drive outrigger hull; a pair of masts mounted on said elongated drive outrigger hull, each of said masts having a rotatable boom rotatably connected thereto, each of said masts and said rotatable booms having a sail attached thereto; a closed loop boom steering device connected to each of said rotatable booms, said closed loop boom steering devices controlling angular position of said rotatable booms with respect to said elongated drive outrigger hull; a pair of angular frame connectors connected to each of said masts, each of said angular frame connectors terminating in an apex; and a symmetric load hull having a pair of identical bows at opposite ends, each of said apices being attached to said symmetric load hull, said symmetric load hull holding said elongated drive outrigger upright in the presence of a wind pressure on said sails and thereby causing said wind pressure

on said sails to drive said elongated drive outrigger and said symmetric load hull through water.

4,061,100
CONVERSION KIT FOR A SAILBOAT
Frank J. Muhlfeld, Scotch Mist II, North Pier, Thwaites Shipyard, City Island, N.Y. 10464
Filed Feb. 11, 1977, Ser. No. 767,848
Int. Cl.² B62B 15/00
U.S. Cl. 114—43 16 Claims

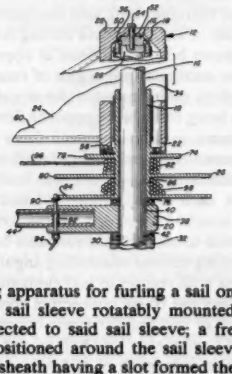
1. A kit for converting a sailboat to a vehicle capable of traversing a hard surface such as ice or the like, said kit comprising,

an elongated spar assembly adapted to be removably mounted on the hull of the sailboat intermediate the bow and stern ends thereof with the longitudinal axis of the spar assembly being substantially perpendicular to the longitudinal axis of the sailboat and with the outboard ends of said spar assembly being laterally spaced from the port and starboard sides of the sailboat, said spar assembly including a deck plate mounted across the upper surface of the hull and extending laterally therebeyond, a backing plate mounted across the lower surface of the hull and extending laterally therebeyond and fastener means for coupling the extending ends of said deck plate and said backing plate to each other whereby said spar assembly may be removably secured to the hull of the sailboat;

first and second surface engaging means mounted on said spar assembly proximate the outboard ends thereof; and

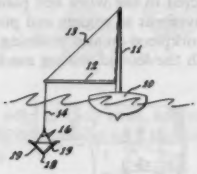
third surface engaging means adapted to be coupled to the tiller of the sailboat beneath the stern end thereof.

4,061,101
SAIL FURLING APPARATUS
Gregory Edward Cook, 3101 S. Wabash, Chicago, Ill. 60616
Filed Feb. 23, 1977, Ser. No. 771,189
Int. Cl.² B63H 9/10
U.S. Cl. 114—106 13 Claims



1. A sail furling apparatus for furling a sail on a mast comprising: a core; a sail sleeve rotatably mounted around said core; a sail connected to said sail sleeve; a freely rotatable exterior sheath positioned around the sail sleeve, said freely rotatable exterior sheath having a slot formed therein, said sail passing through said slot of said freely rotatable exterior sheath; a boom connected to said core and said sail; and a furling rigging connected to said sail, said furling rigging controlling an amount of sail which is drawn out of said freely rotatable exterior sheath.

4,061,102
ROLL STABILIZER FOR BOATS
Thomas B. Bissett, 5530 Topa Topa Drive, Ventura, Calif. 93003
Filed Oct. 28, 1976, Ser. No. 736,519
Int. Cl.² B63B 39/00, 43/02
U.S. Cl. 114—122 3 Claims



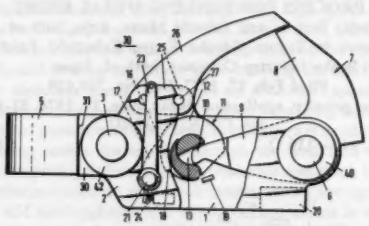
1. A stabilizer device for minimizing the roll of a boat including

two plates connected by a hinge,

a plurality of bridles attached to the plates and with the bridle supporting the stabilizer in the water so that when the stabilizer is pulled up through the water by the bridles the plates open about the hinge to resist upward motion and when the stabilizer is released the plates close together about the hinge to permit the stabilizer to fall rapidly, and

a spring attached between the plates normally pulling the plates toward the closed position to increase the speed of closing of the plates to increase the speed of fall.

4,061,103
TOWING HOOK
Johannes Josephus Mampaey, Dordrecht, Netherlands, assignor to Machinefabriek Mampaey Marine Engineering B. V., Dordrecht, Netherlands
Filed July 26, 1976, Ser. No. 708,620
Int. Cl.² B63B 21/60
U.S. Cl. 114—252 2 Claims



1. A towing hook device such as for mooring or towing a vessel comprising

a frame;

a towing hook mounted in the frame pivotally about a first axis and having a blocking arm with one end thereof extending from the first axis;

a blocking member mounted in the frame pivotally about a second axis and having a shaft portion reduced on one side to form an eccentric blocking step which, when the blocking member is in a blocked towing position, abuts the one end of the blocking arm and which, when the blocking member is in a release position, releases the blocking arm and towing hook;

said blocking member also including an eccentric drop-

shaped or comma-shaped body mounted adjacent the reduced side of the shaft portion for co-acting with the one end of the blocking arm when the blocking member is in the release position to return the blocking member to the blocked towing position;

further said blocking member including at least one concentric locking disc having a latch projection and a limit projection;

pawl means including biasing means for engaging the latching projection to latch the blocking member in the blocked towing position; and

limit stop means mounted on the frame for engaging the limit projection to prevent movement of the blocking member past the release position.

4,061,104

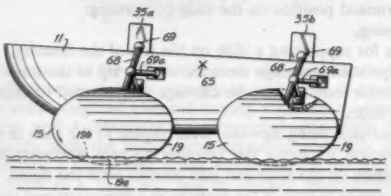
HYDROFOIL VESSEL

Gifford Pinchot, III, R.D. 1 No. 58A, Jordanville, N.Y. 13361

Division of Ser. No. 572,173, April 28, 1975, Pat. No. 3,996,872. This application June 7, 1976, Ser. No. 693,506

Int. Cl.² B63B *1/28*

U.S. Cl. 114—281 **6 Claims**



1. A hydrofoil vessel comprising, in combination:

a body portion;

at least one pair of circular members supported on opposite sides of the body portion, each of the circular members having a thin foil shaped annular peripheral portion, said circular members being positioned at an angle with respect to the water surface with a geometric segment of said circular peripheral foil portion thereof extending into the water to support the vessel when operated at its higher speeds by virtue of the forward movement of the vessel;

said segment of the annular peripheral foil portion extending into the water defining a chord which, when said vessel is viewed in plan, defines an angle with the longitudinal axis of the body portion; and

mounting means for rotatably connecting the circular members of the body portion including means for varying the said angle between the longitudinal axis of the body portion and the chord of the immersed segment of said annular peripheral foil portion of the circular members.

4,061,105

SAIL TO ROW

Onofre S. Garcia, 77 Prospect St., Newark, N.J. 07105

Filed June 30, 1976, Ser. No. 701,242

Int. Cl.² B63H *13/00*

U.S. Cl. 115—3 **21 Claims**

1. A sail actuated oar device for propelling a boat comprising:

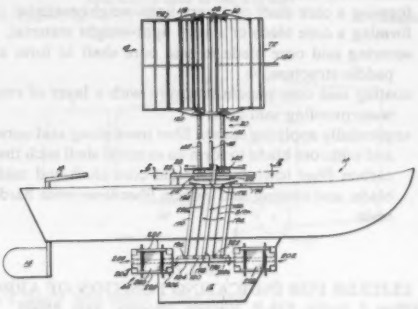
A. a rotary sail structure rotatably mounted relative to the upper end portion of a shaft, normally, vertically mounted amidships of a boat, said rotary sail structure comprising, a plurality of vertically disposed, radially extending sail assemblies, fixed relative to a vertical tower means, rotatably mounted on said shaft; each sail assembly including sail panel means pivotal between first, generally planar, closed positions relative to an openwork frame assembly to cause a rotary movement of said rotary sail structure under the influence of wind forces directed against outside surfaces of said closed sail panel means, and second, open positions relative to said openwork frame assembly, accomplished by wind forces being directed against inside surfaces of said sail panel means, to permit an unrestricted movement of the wind forces through said openwork frame;

B. a power transmission means fixed relative to said rotatable tower in a spaced relation below said rotary sail structure;

C. oar means including reversible oar blade means to provide for selective forward and reverse movements of the boat;

D. means to transmit reciprocating, back and forth movement to said oar means from said power transmission means; and

E. means to selectively shift said oar blade means to accomplish the forward or reverse movements of the boat,



wherein each openwork frame assembly comprises inner and outer, generally rectangular peripheral frames, and at least one intermediate vertical and horizontal frame member fixed relatively to each of said peripheral frames; said outer rectangular frame is hinged for pivotal movement relative to the outer vertical side of said innter rectangular frame, and including a radially extending rod fixed relative to the inner rectangular frame to contact and maintain said outer rectangular frame in radial alignment therewith when the wind forces are directed against said outside surfaces of said sail panel means and to permit said outer rectangular frame and associated sail panel means to be pivoted angularly in a downwind direction when the wind is directed against said inside surfaces of said sail panel means.

4,061,106

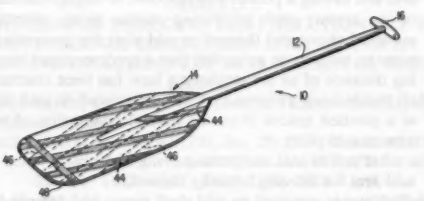
RACING PADDLE AND METHOD OF MAKING THE SAME

Maximilian Ware, P.O. Box 147, Rapidan, Va. 22733

Filed Nov. 17, 1976, Ser. No. 742,424

Int. Cl.² B63H *16/04*

U.S. Cl. 115—24.1 **9 Claims**



1. An extremely light-weight racing paddle comprising:

a core shaft formed of a very light-weight, easily shaped material,

a core blade, also formed of a very light-weight and easily

shaped material, secured to said core shaft, to form a paddle core structure,

an external shell formed of hardened light-weight filamentary material molded around and bonded to said core shaft for providing an external structural reinforcement thereof,

said external shell including continuous layers of said hardened light-weight filamentary material which overlap said core shaft and said core blade; and,

a pattern of reinforcing strips of hardened light-weight filamentary material bonded to said core blade for providing an external structural reinforcement thereof,

whereby an extremely light-weight, high-strength racing paddle is formed in the shape of said light-weight paddle core structure.

8. A method of making an extremely light-weight racing paddle, comprising the steps of:

forming a core shaft of a very light-weight material,

forming a core blade of a very light-weight material,

securing said core blade to said core shaft to form a core paddle structure,

coating said core paddle structure with a layer of resin for waterproofing said core,

sequentially applying carbon fiber tows along said core shaft and said core blade to form an external shell such that said carbon fiber tows overlap said core shaft and said core blade, and coating said carbon fiber tows with hardening resin.

4,061,107

CLICKER FOR INDICATING POSITION OF ARROW

Wilbur J. Smith, 133 E. Victory, Phoenix, Ariz. 85040

Filed Nov. 11, 1976, Ser. No. 740,817

Int. Cl.² G08B *3/00*

U.S. Cl. 116—67 R **6 Claims**

1. An arcuate bow draw check clicker comprising:

a plate mountable on the side of a bow in the arrow area,

an audible signal generating means comprising an extended arm and having a pointer end disposed to engage the shaft of an arrow, said generating means being pivotally mounted at one end thereof on said plate for generating a noise to indicate to an archer that a predetermined drawing distance of an arrow along a bow has been reached,

shaft means having one end pivotally mounted on said plate at a position spaced from the pivotal connection of said arm to said plate,

the other end of said shaft means being slidably mounted on said arm for moving laterally thereof,

tension means mounted on said shaft means and arranged to extend between said plate and the point of engagement with said arm for biasing said arm in a given direction, and

adjustment means mounted on the other end of said shaft means for varying the length of that portion of the shaft means between said plate and its point of engagement with said arm for varying the position of the pointer end of said arm on a bow.

4,061,108

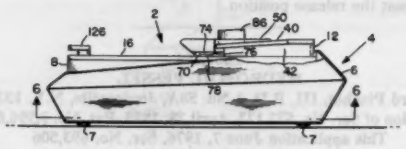
SLIDE SMEARING DEVICE

Marshall S. Levine, Wayne, and Albert A. Faulkner, Conshohocken, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed May 19, 1976, Ser. No. 688,101

Int. Cl.² B05C *11/04*

U.S. Cl. 118—100 **30 Claims**



1. A device for smearing on a slide a liquid placed at a predetermined position on the slide comprising:

a housing,

means for supporting a slide on the top of the housing,

a reciprocable carriage mounted on the top of the housing,

a spreader mounted on the carriage and adapted to engage the slide,

said carriage being movable with respect to the slide in one direction to move the spreader to said predetermined position on the slide and into contact with the liquid,

drive means to retract the carriage at a predetermined speed in the opposite direction to cause the spreader to smear the liquid on the slide,

said drive means including a spring and an air dashpot having a cylinder with means to restrict the passage of air through one end and being open at its other end and a piston connected to the carriage adjacent the open end when the carriage is retracted, and

the restricting means being adjustable to provide for the selection of different retracting speeds.

4,061,109

COATING AND SMOOTHING APPARATUS

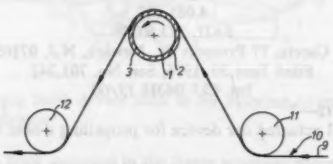
Roger Anthony Allen, Gt. Missenden, England, assignor to Wiggins Teape Limited, London, England

Filed Mar. 9, 1976, Ser. No. 665,225

Claims priority, application United Kingdom, Mar. 10, 1975, 9788/75

Int. Cl.² B05C *11/02*

U.S. Cl. 118—118 **7 Claims**



1. Apparatus for coating a web of paper or other sheet material, comprising means for applying a liquid coating composition to a surface of the web, and, beyond said means in the direction of web movement, a smoothing roll having a soft elastomeric covering with a smoothing surface which is pitted, said pitted smoothing surface being substantially impermeable to liquid coating compositions, the smoothing roll being drivable in use to permit its surface to move relative to the coated

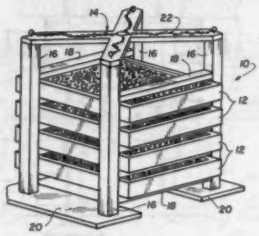
surface of the web, thereby to smooth the coating previously applied by said means.

4,061,110

APPARATUS AND METHOD FOR THE FARMING OF CLAMS

Wallace C. Steidle, Middle Line Highway, Water Mill, N.Y. 11976

Filed July 26, 1976, Ser. No. 708,392
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—4 3 Claims



1. Apparatus for the farming of clams in waters having rapidly flowing currents comprising a plurality of trays made of heavily weighted material having a generally rectangular bottom and 4 integrally interconnected side walls formed integrally with the bottom and extending vertically upward therefrom, a supporting frame having means for supporting said trays in a vertically spaced stacked relationship, base means on said supporting frame for standing upon bottom land below water and hoisting means attached with said supporting frame for raising said frame onto and off of said bottom land, each of said trays comprising a layer of sand in sufficient quantity to support clam life into which said clams are embedded, spaced apart from each other for growing, and a layer of gravel covering said layer of sand.

4,061,111

AUTOMATIC CHINCHILLA SANDER AND CLEANER

Charles A. Smith, 2540 Meldrum St., Windsor, Ontario, Canada

Filed June 28, 1976, Ser. No. 700,452
Int. Cl.[2] A01K *67/00*
U.S. Cl. 119—159 6 Claims

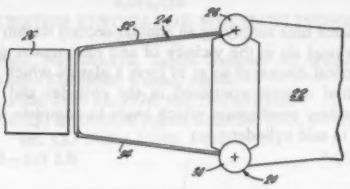
1. A device for sanding chinchillas or similar furbearing animals, comprising in combination a circular container having an open entrance in its curved wall for the entry and discharge of an animal therethrough, and containing a sand mixture in the bottom thereof; a screen, located within said container for screening said sand and discharging said animal, which rotates upon a central shaft, said shaft consisting of an inner solid shaft and an outer hollow shaft; a press fitted pin running through both said shafts for connecting or disconnecting said outer shaft to or from said inner shaft; a speed reducer for rotating said screen; upper and lower stop means within said container for locating said screen in an animal entry position and an animal discharge position; clutch means for connecting said inner shaft to said speed reducer; coupling means for connecting said inner shaft on one device to the inner shaft of another similar device; and a removable partition located between the outer shaft and the bottom of said entrance, within the circular container, and slidably supported and held between a pair of U-shaped tracks which are attached to the side walls of the container, to prevent the animal from by-passing the screen entering or being discharged by said screen.

4,061,112

STEAM GENERATING PLANT

Thomas Gibson, Potters Bar, England, assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jan. 26, 1976, Ser. No. 652,602
Claims priority, application United Kingdom, Feb. 7, 1975, 5357/75
Int. Cl.[2] F22B *1/02, 21/22*
U.S. Cl. 122—7 R 3 Claims



1. In a waste heat steam boiler plant:

a. A waste heat boiler comprising:
   i. a steam drum adjacent to the top of said boiler;
   ii. a steam and water drum adjacent to the bottom of said boiler;
   iii. downcomer means connecting said steam drum to said steam and water drum; and
   iv. riser means connecting said steam and water drum to said steam drum;
b. a waste gas duct; and
c. a tapered transition chamber adapted to be connected between said duct and said boiler, said transition chamber having a roof sloping upwardly from said duct, a floor sloping downwardly from said duct, and angularly disposed sidewalls whereby the cross-sectional area of said transition chamber increases between said duct and said boiler, said transition chamber defined by air-tight side walls, air-tight floor and air-tight roof, said walls, floor and roof including water-cooled tubes, means rigidly uniting said tubes, said tubes being connected at their upper ends to said steam drum and at their lower ends to said steam and water drum so that said tubes extend upwardly over their entire length from said steam and water drum to said steam drum.

4,061,113

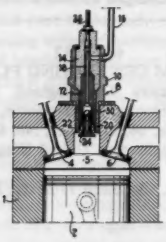
PROCESS FOR REDUCING THE POLLUTION DUE TO AN INTERNAL COMBUSTION ENGINE, AND AN ENGINE INCLUDING THE APPLICATION OF SAID PROCESS

Roland Beyler, 61, Avenue du Marechal Joffre, 94360 Bry-sur-Marne, France

Continuation of Ser. No. 437,739, Jan. 29, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,175
Int. Cl.[2] F02B *41/00*; F02P *1/00*; F02B *33/00*
U.S. Cl. 123—26 22 Claims

1. A process for reducing pollution due to an internal combustion engine piston and cylinder, which cylinder has two spark-producing electrodes in a combustion chamber of the cylinder, comprising starting a supply of high-tension electric current to said electrodes to initiate a high-tension electrical

fuel-igniting discharge in the combustion chamber at the end of an air/fuel mixture compression stroke to cause explosion and primary combustion of said mixture, prolonging said supply of current to said electrodes in a continuous uninterrupted manner during at least a major part of the expansion stroke while at



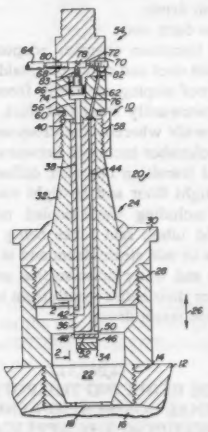
the same time supplying an annular-section stream of whirling additional air in the vicinity of and encompassing said initial electrical discharge so as to form a plasma which reaches the residual mixture contained in the cylinder and produces a secondary combustion which tends to complete the combustion in said cylinder.

4,061,114

LEAN CHARGE IGNITION SYSTEM

Nathan H. Christopher, 16833 Melbourne Drive, Laurel, Md. 20810

Filed Aug. 20, 1976, Ser. No. 716,095
Int. Cl.[2] F02B *3/06, 3/08, 3/10*
U.S. Cl. 123—32 SJ **9 Claims**



1. An improved fuel ignition system for an internal combustion engine having at least one engine cylinder, comprising:

a. fuel igniter means having a pair of electrodes, one of said electrodes having (1) a first passage, and (2) a second passage for inlet of fuel into a neighborhood of a spark gap formed by said electrodes; and,

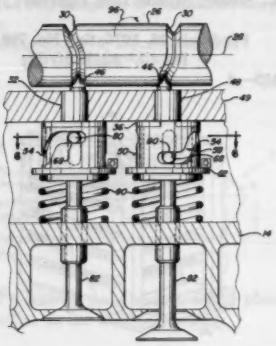
b. fuel injection means having a pair of fuel injection means passages aligned with said first and second passages of said fuel igniter means, said fuel injection means being coupled to a fuel supply for displacing said fuel through said fuel igniter means second passage.

4,061,115

VALVE TRAIN FOR INTERNAL COMBUSTION ENGINE

Wilfred F. Predhome, Jr., 487 Ursula St., Aurora, Colo. 80011

Filed June 1, 1976, Ser. No. 691,429
Int. Cl.[2] F01L *1/34*
U.S. Cl. 123—90.16 **9 Claims**



1. A valve train for a poppet valve of a reciprocating internal combustion engine comprising:

an internal combustion engine;

a cam shaft having an axis of rotation and being mounted on said engine for rotation about its axis at angular velocities which are a function of engine rpm;

means forming a cam surface on said shaft;

a cam follower having an axis of rotation;

means for mounting said cam follower on said engine in engagement with the cam surface of said cam shaft to convert rotation of said cam shaft into reciprocating rotation of said cam follower about its axis of rotation;

a reciprocating member having projecting means;

cam means operatively connected to said cam follower;

movable control means concentrically mounted with respect to said cam means;

said cam means, control means and projecting means interacting to convert reciprocal rotation of said cam follower to reciprocating linear motion of the reciprocating member substantially along the axis of rotation of said cam follower;

said cam means and control means varying the amplification and timing of said reciprocating member with respect to the angular position of the cam shaft as a function of the position of said control means with respect to said engine;

servo means operatively connected to the control means to vary the control means position to vary the amplitude and timing of the reciprocating member as a function of engine rpm and load;

a poppet valve; and

means for operatively connecting said valve to said reciprocating member.

4,061,116

KNOCK LEVEL CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

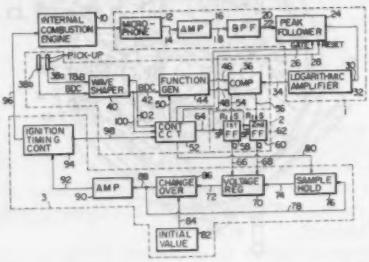
Yoshinori Saida, and Kazumasa Katoh, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 16, 1975, Ser. No. 623,020
Claims priority, application Japan, Oct. 17, 1974, 49-119629; May 20, 1975, 50-59207; May 20, 1975, 50-59208; June 4, 1975, 50-74700[U]
Int. Cl.[2] F02D *5/04*
U.S. Cl. 123—117 D **11 Claims**

1. A knock level control apparatus for an internal combustion engine, which comprises:

converting means for converting sounds emitted from said internal combustion engine into electrical signals;

knock voltage generating means for generating a knock voltage representing a maximum voltage of frequency components of said electrical signal within a predetermined frequency band width, said knock voltage generating means including, a plurality of band pass filters each for exclusively passing therethrough frequency components of said electrical signal within a predetermined frequency band, the respective frequency bands of the filters being different from one another, a maximum value detector for passing therethrough a maximum one of



frequency components passed through said band pass filters, a peak follower for producing a peak voltage equal to a maximum voltage of said maximum one of the frequency components, and a logarithmic amplifier for logarithmically amplifying said peak voltage;

knock level discriminating means for producing a retard signal when said knock voltage exceeds a higher predetermined level and an advance signal when said knock voltage lowers below a predetermined level; and

ignition timing control means for controlling the ignition timing of said internal combustion engine in accordance with said advance and retard signals.

4,061,117

METHOD OF CONTROLLING AIR-FUEL MIXTURE IN INTERNAL COMBUSTION ENGINE AND A SYSTEM THEREFOR

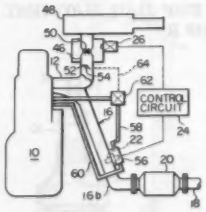
Kenji Ikeura, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 30, 1976, Ser. No. 672,020

Claims priority, application Japan, Mar. 31, 1975, 50-38926; May 26, 1975, 50-62647

Int. Cl.[2] F02D *35/00, 75/10*

U.S. Cl. 123—119 EC **11 Claims**



1. In an automotive internal combustion engine including a mixture supply system for producing from air and fuel delivered thereto an air-fuel mixture to be fed to the cylinders of the engine and an exhaust system having incorporated therein a catalytic converter which is reactive to at least one predetermined type of air contaminative compound in the exhaust gases emitted from the engine cylinders and which exhibits its maximum conversion efficiency to the exhaust gases resulting from an air-fuel mixture having a predetermined air-to-fuel ratio, a method of controlling the air-to-fuel ratio of the mixture to be produced in the mixture supply system, comprising detecting the concentration of at least one predetermined type of chemical component of the exhaust gases from the engine cylinders by means of an exhaust sensor located in the exhaust system downstream of the branch tube portions of the exhaust manifold of the exhaust system and upstream of the catalytic converter, said exhaust sensor having an external portion projecting outwardly from the exhaust system, producing a signal representative of the detected concentration of said chemical component, controlling the delivery rate of at least one of air and fuel to the mixture supply system in accordance with said signal for regulating the air-to-fuel ratio of the mixture in the mixture supply system toward said predetermined air-to-fuel ratio, detecting high-load operating conditions of the engine, and inducing a forced flow of cooling fluid through said external portion of the exhaust sensor under high-load operating conditions of the engine.

4,061,118

CARBURETOR SYSTEM FOR MULTICYLINDER ENGINE

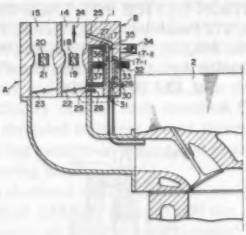
Yuhiko Kiyota, Nagaokakyo, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed June 17, 1976, Ser. No. 697,125

Claims priority, application Japan, June 24, 1975, 50-78131

Int. Cl.[2] F02M *13/06;* **F02B** *33/00*

U.S. Cl. 123—119 LR **7 Claims**



1. A carburetor system for use in a multicylinder engine which comprises a carburetor having a main fuel-air mixture supply device to supply a mixture leaner than stoichiometric to at least one first cylinder and at least one second cylinder, a rich mixture supply means, integrated into the carburetor, having a rich mixture forming passage to make a mixture richer than stoichiometric, a first passage means to connect the main mixture supply means with the first and second cylinders, a second passage means to connect the rich mixture forming passage with the second cylinder, a fuel addition passage having a first fuel passage to supply fuel to the rich mixture forming passage and a second fuel passage to the main mixture supply means, means to actuate a first and second valve respectively provided in said first and second fuel passage, means to actuate a third valve in said rich mixture forming passage, and operation control means for said first, second and third valves.

4,061,119

EXHAUST GAS RECIRCULATION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Tomon Takeshita, Nagoya, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed July 21, 1976, Ser. No. 707,339

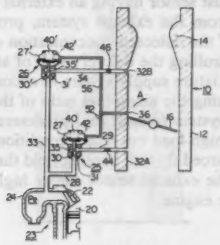
Claims priority, application Japan, Apr. 27, 1976, 51-47281

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **5 Claims**

1. An exhaust gas recirculation apparatus comprising conduit means connecting the exhaust system of an engine to the intake system thereof at a first location downstream of the throttle valve of the engine and a second location upstream of said throttle valve, normally closed valve means in said con-

duit means to control flow from said exhaust system to said first and second locations, at least one of said valve means having a closed chamber with a diaphragm therein normally resiliently biasing a valve part to closed position and means to connect said closed chamber to a port located slightly above



the fully closed position of said throttle valve whereby vacuum from said port may cause said diaphragm to move said valve part to opening position against said resilient bias and means to cause an effect of said vacuum to open the other of said valve means.

4,061,120

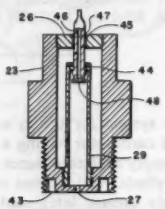
IGNITION DEVICE FOR ENGINES

James C. Hughes, 172 Poinsetta Circle, Terrell, Tex. 75160

Division of Ser. No. 362,108, May 21, 1973, Pat. No. 3,954,093. This application Apr. 15, 1976, Ser. No. 677,142

Int. Cl.[2] F02P *23/00*

U.S. Cl. 123—143 A **5 Claims**



1. An ignition device for use in an internal combustion engine of the kind in which successive charges of fuel air mixture are introduced into a combustion chamber, compressed, ignited, expanded, and exhausted, and in which said combustion chamber has a cooled wall, said device comprising:

an elongate ignition cell mounted in said cooled wall, said cell having an orifice providing communication between the interior of said cell and the interior of said combustion chamber;

mounting means for securing said cell in said cooled wall, including means blocking flow of heat between said cell and said cooled wall;

housing means surrounding said cell for controlling flow of heat between said cell and the ambient;

an electrically insulating sleeve passing through and sealed to the end of said cell remote from said combustion chamber, said sleeve also passing through said housing means;

an electrical conductor passing through said insulating sleeve from a point external of said housing means to a point within said cell, said conductor being sealed to said sleeve,

and a sparking electrode conductively connected to the inner end of said conductor within said cell, said electrode being at all points spaced from the walls of said cell.

4,061,121

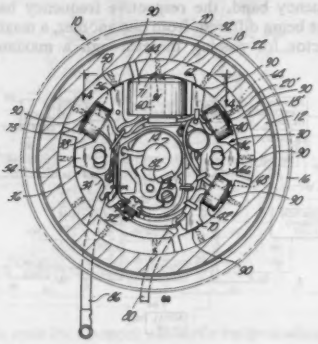
MAGNETO-ALTERNATOR WITH MAGNETO ENERGY LIMITING

John Norman MacLeod, Ann Arbor, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Apr. 30, 1975, Ser. No. 573,101

Int. Cl.[2] F02P *1/02*; H02K *21/22*

U.S. Cl. 123—149 R **29 Claims**



1. An electrical generating system for use in the ignition circuit of an internal combustion engine comprising a rotor adapted to be driven by said engine, magnetic means on said rotor to establish a magnetic field, a stator having a plurality of magnetic core legs thereon, said rotor and said stator being operatively arranged and disposed relative to each other so that said magnetic field is coupled to respective first and second core legs through respective first and second air gaps during relative rotation of said rotor and said stator, and an ignition coil on one of said first and second legs and responsive to said field to generate a first electrical output for igniting a spark at a spark plug and wherein said first air gap between said first leg and said magnetic means is substantially greater than said second air gap between said second core leg and said magnetic means so as to limit said output at said first coil at normal operating speeds of said engine without substantially limiting said output at starting speeds of said engine.

4,061,122

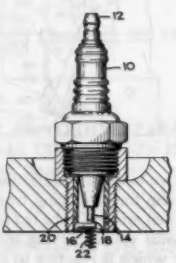
SPARK PLUG

Robert G. Edgar, and Miriam E. Edgar, both of 4871 Geneva Ave., Concord, Calif. 94521

Filed Jan. 8, 1976, Ser. No. 647,352

Int. Cl.[2] F02P *13/00, 23/00*; H01T *13/00, 13/20*

U.S. Cl. 123—169 R **1 Claim**



1. A spark plug for an internal combustion engine which comprises

a body member,

a pair of electrodes supported by said body member to pro-

vide a spark gap in the combustion chamber of the engine, and

a reaction member supported adjacent said spark gap so as to lie within the flame ignition and combustion zone of the engine,

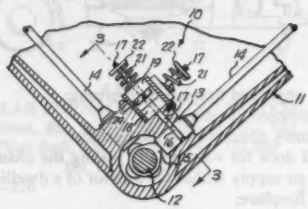
said reaction member including catalytic agents including a mixture of boron and manganese compounds.

4,061,123

ENGINE DE-COMPRESSION MECHANISM

Robert W. Janes, 215 E. Page St., Orlando, Fla. 32806

Filed Oct. 15, 1976, Ser. No. 732,738
Int. Cl.² F02D *13/06*
U.S. Cl. 123—198 F **3 Claims**



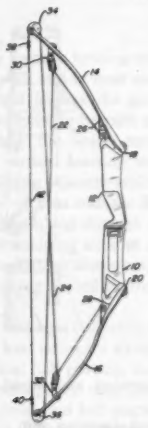
1. A valve deactivator for de-compressing selected cylinders of an internal combustion engine of the type including a cam shaft and valve lifters comprising an annular detent groove formed in the valve lifters, a reciprocatable detent shaft engageable in the groove to lock the valve lifter in valve lifted position thereby removing said lifters from said cam shaft, means for moving said detent shaft from valve lifter unlocking position to valve lifter locking position and back again, and spring means for further disengaging said detent shaft from said groove in said valve lifter upon inaction of the means for moving said detent shaft.

4,061,124

COMPOUND BOW WITH CABLE TENSIONING ASSEMBLY

Norman Arlo Groner, Kalkaska, Mich., assignor to Victor United, Inc., Chicago, Ill.

Filed Nov. 10, 1975, Ser. No. 619,370
Int. Cl.² F41B *5/00*
U.S. Cl. 124—23 R **21 Claims**



1. A compound archery bow comprising:

an elongated handle member having a longitudinal axis and opposite spaced end portions;

a pair of limb members for mounting on said spaced end portions having inner end portions and outer end portions;

a limb end portion receiving member affixed to said handle end portions;

curved rib means on each of said receiving member extending ransversely of said longitudinal axis for mounting one of said limb members;

first threaded fastening means on each of said receiving member spaced longitudinally from said curved rib means for attaching one of said limb members; said receiving member including flanges for aligning said handle member and said limb members;

curved abutment groove means on each of said limb inner end portions for abuttingly pivotally supporting one of said limb members on said curved rib means in load bearing relationship therewith said groove means being removably mounted on said limb members;

a second threaded fastening means providing the only releasably securing connection between the handle member and the limb member, said fastening means being adapted to be associated with each of said inner end portions and said first threaded fastening means for adjustably fixedly mounting said limb members on said spaced end portions;

load bearing means mounted on each of said inner end portions of said limb members for abutting load transferring engagement with said second threaded fastening means in each of a number of infinitely variably positions between a first position of minimum inclination of said inner end portions relative to said spaced end portions providing maximum draw weight and a second position of maximum inclination of said inner end portions relative to said spaced end portions providing minimum draw weight;

said load bearing means including elongated slot means in said inner end portions of said limb members extending longitudinally of said limb members for receiving said second threaded fastening means therewithin;

said receiving member overlying said groove means and said load bearing means;

elongated abutment surface means on said inner end portions of said limb members adjacent said slot means for abutting engagement with said second threaded fastening means;

cable means attached to said bow for propelling an arrow from said bow;

cable attachment means on each of said inner end portions for attaching said cable means to said limb members;

wheel means on the outer end portions of said limb members for rotatably supporting said cable means;

draw string means attached to said cable means for propelling an arrow from the bow and being connected to said cable means and forming one uninterrupted path for transmitting a draw force.

4,061,125

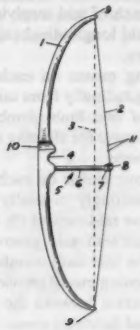
BOWSTRING POSITIONING DEVICE

George H. Trotter, 7107 Janey St., Shreveport, La. 71108

Filed Nov. 28, 1975, Ser. No. 635,865
Int. Cl.² F41B *5/00*
U.S. Cl. 124—24 R **7 Claims**

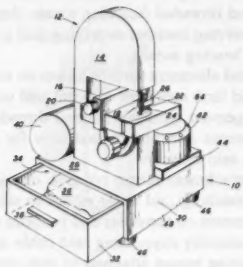
1. A bowstring positioning device for a bow having a bowstring comprising a shaft having one end fixedly connected to said bow and extending in the direction of curvature and bend of said bow, and the opposite end positioned in alignment with the path of said bowstring and terminating at a point intermedi-

ate the normal, straight line position of said bowstring and the position of said bowstring when said bow is drawn, to receive



and stop said bowstring when said bow is drawn and said bowstring is released.

4,061,126
CERAMIC TILE CUTTING APPARATUS
Ronald F. Schlangen, R.R. No. 1, Richmond, Minn. 56368
Filed Nov. 2, 1976, Ser. No. 738,250
Int. Cl.² B28D *1/08*
U.S. Cl. 125—21 **6 Claims**



1. In a band saw cutting apparatus comprising a C-frame, a pair of wheels journalled to the C-frame, a cutting blade carried by the pair of wheels, the output shaft of a motor coupled to one of the wheels, the improvement comprising;

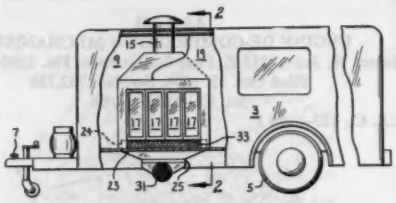
a. a hollow container providing vertical support for the band saw cutting apparatus,

b. a blower motor fixedly secured to the container having a blade assembly secured to a shaft thereof, a housing enclosing the blower motor and the blade, said container having a first opening therein, the first opening communicating to the housing, a filter being disposed removably secured covering the first opening,

c. a drawer, the drawer being slideably affixed to the container, the drawer having an open mouth portion disposed above the marginal edges of the side wall thereof, the container having a second opening in the walls thereof, the second opening being disposed adjacent a lowermost one of said pair of wheels and above said drawer, the first opening of said container being located adjacent the second opening and covering a portion of said drawer, and

d. a resilient material fixedly secured to a portion of the exterior surface of the container.

4,061,127
MOBILE HOME FIREPLACE WITH EXTERNAL AIR SUPPLY
Eugene W. Fisher, 2040 W. Clay St., Dallas, Oreg. 97338
Filed May 1, 1975, Ser. No. 573,540
Int. Cl.² F24B *1/18*
U.S. Cl. 126—120 **3 Claims**



1. An improved fireplace comprising:

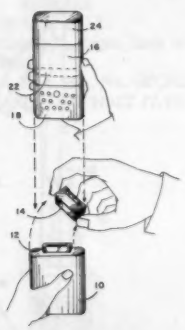
a combustion chamber;

a chimney connected to the chamber;

a solid door for substantially sealing the chamber off from the air supply within the interior of a dwelling containing the fireplace;

a combustion chamber air supply duct having an upper end and a lower end, the upper end defining an air inlet hole and terminating within the combustion chamber by protrusion through the chamber floor to a point above said floor but below and behind the door so that burning materials and hot ashes on the floor are substantially prevented from entering the duct, the lower end of the duct having an elongate section protruding through the floor of the dwelling to a position below the floor outside the dwelling; the duct defining a substantially unobstructed air path from a source of exterior air to the interior of the chamber behind the door and above the chamber floor when the chamber is sealed.

4,061,128
HAND-WARMING AND LIQUID-HEATING DEVICE
Curtis B. Storey, Box 290, Rte. 1, Limerick, Maine 04048
Filed June 21, 1976, Ser. No. 697,855
Int. Cl.² A61F *7/06*
U.S. Cl. 126—210 **7 Claims**



1. A hand-warming and liquid-heating unit combination comprising:

a catalytic hand-warming unit;

a liquid-containing chamber affixed to said catalytic hand-warming unit;

an insertion member, having a plurality of apertures for air circulation to a heating element of said hand-warming unit being slideably insertable between and engageable with

said hand-warming unit and said liquid-containing chamber;

a baffle member to enclose and divide said liquid-containing chamber from said hand-warming unit;

a cover cap slideably insertable over the opening of said liquid-containing chamber in a fluid-tight relationship;

a heating element associated with said cover cap to protrude within said liquid-containing chamber; and

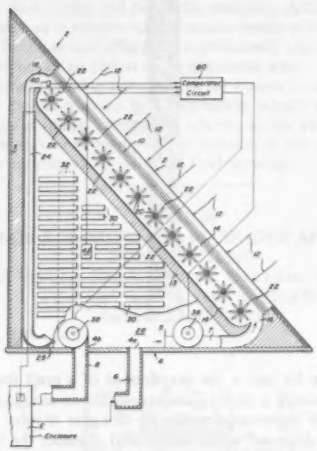
an energizing source associated with said heating element compartmentally segregated from said liquid-containing chamber.

4,061,129

SOLAR FURNACE HEATING SYSTEM

Melvin A. Wilson, Rte. 1, Box 514, Stevensville, Md. 21666

Filed Sept. 13, 1976, Ser. No. 722,698
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **14 Claims**



1. In a forced fluid solar furnace heating system including a housing having a bottom wall and at least one inclined transparent vertical wall adapted to face the sun, heat collector means arranged within said housing beneath and adjacent said vertical wall for receiving the solar energy transmitted through said transparent vertical housing wall, heat storage means contained in said housing adjacent said bottom wall, and means for directing a flow of heat transfer fluid successively across said heat collector means and through said heat storage means, said housing also containing an inlet opening for supplying a medium to be heated to the heat storage means, and an outlet opening for withdrawing heated air from the heat storage means;

the improvement wherein said heat collector means comprises

a. at least one rotatable heat collector element including

1. a generally cylindrical hub portion; and

2. a plurality of generally planar vane portions extending radially outwardly from said hub portion; and

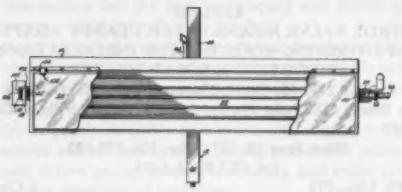
b. means connecting heat collector element with said housing for rotation about the longitudinal axis of said hub portion, the axis of rotation of said heat collector element being parallel with and spaced from said transparent vertical wall.

4,061,130

SOLAR ENERGY DEVICE

Eduardo E. Gonzalez, 2284 NE. First St., Boca Raton, Fla. 33432

Filed Apr. 28, 1975, Ser. No. 572,122
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **11 Claims**



1. In combination, sun tracking means and a solar energy collector, said solar energy collector including sun energy collecting means to continuously conduct flowable material and including an inlet and an outlet for the material, and a main collector face arranged in sun energy transferring relation with the collecting means, said tracking means including means to selectively orient the face to receive sun rays and including drive means to orient the collector face, and means to support the combination;

said means to orient including sun-seeking sensing means to sense the azimuth angle and elevation angle of the sun and means operatively interconnecting said sensing means and drive means to orient,

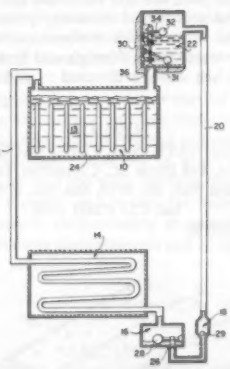
connector means including conduit to continuously travel flowable material through said inlet and outlet simultaneously with the operation of said tracking means.

4,061,131

HEAT TRANSFER SYSTEM PARTICULARLY APPLICABLE TO SOLAR HEATING INSTALLATIONS

Hoy R. Bohanon, Muskogee, Okla., assignor to Acme Engineering and Manufacturing Corporation, Muskogee, Okla.

Filed Nov. 24, 1975, Ser. No. 634,898
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **15 Claims**



1. A system for transferring heat from a source at high temperature to a sink at relatively lower temperature wherein the sink is located at an elevation below the source, comprising an evaporator in heat exchange relationship with said source, a condenser in heat exchange relationship with said sink, vapor conduit means connecting the top portion of said evaporator directly to said condenser, a check valve, conduit means connecting said check valve to said condenser, a liquid transfer

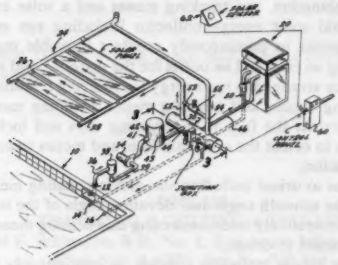
tank positioned above said evaporator and provided with means for intermittently transferring the liquid accumulated in said transfer tank to said evaporator in response to the volume of the liquid in said transfer tank, liquid conduit means connecting said check valve to said transfer tank, and a volatile fluid within the system.

4,061,132

CONTROL VALVE MEANS PARTICULARLY ADAPTED FOR SWIMMING POOL HEATER INSTALLATIONS EMBODYING A SOLAR HEATER

Larry Ashton, 1791 Ide Court, Thousand Oaks, Calif. 91360, and Leo Block, 4188 Lake Harbor Lane, Westlake Village, Calif. 91361

Filed June 25, 1976, Ser. No. 699,622
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **4 Claims**



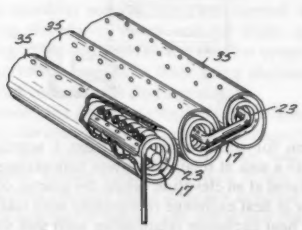
1. A valve structure adapted for controlling flows of water through a first path and a second path, the structure including a casing having an inlet, a first outlet for said first path, and a second outlet for said second path, valve means and seat means in said housing positionable whereby to direct water alternatively from the inlet to the first outlet only or from the inlet to the second outlet only and actuator means, a heat exchanger in the first path of flow and a heat exchanger in the second path of flow, one of said heat exchangers being a solar absorber, the said heat exchangers being connected to a swimming pool, said housing having a second inlet adapted to receive return water from said second path, the said valve and seat means including valve means and seat means relatively positionable whereby water from said second inlet is communicated to said first outlet whereby water flows through said first path and second path in series when water is directed to said second outlet.

4,061,133

COMBINATIONAL FIREPLACE UNIT

Samuel J. Swain, 824 Dixie St., Carrollton, Ga. 30117

Filed Nov. 26, 1975, Ser. No. 635,422
Int. Cl.² F24H *1/44*
U.S. Cl. 126—350 R **6 Claims**



1. A combinational fireplace arrangement comprising at least one log-shaped member having a hollowed center portion and having means for transferring air from below the log-shaped member to said hollowed center portion thereof and having aperture means extending from said hollowed center portion to the outside of said log-shaped member proximate the top thereof, means for supporting said at least one log, a spiral shaped tube extending within the hollowed center portion and substantially throughout the length of said at least one log, and a fuel burning means extending along the longitudinal axis defined by said spiral tubing, said fuel burning means heating a fluid passing through said spiral tubing while at the same time generating the flame which passes through said apertures upwardly away from said log-shaped member to give the appearance of a burning log.

4,061,134

ARTERIAL GRAFT DEVICE

Peter B. Samuels, 14708 Sutton St., Sherman Oaks, Calif. 91403, and Ernest C. Wood, 2461 Ivanhoe Drive, Los Angeles, Calif. 9000

Filed Oct. 28, 1975, Ser. No. 626,070
Int. Cl.² A61F *1/24*; A61B *19/02*
U.S. Cl. 128—1 R **22 Claims**

1. A device for use in the preparation of a graft for blood vessels comprising a sealed chamber within an elongate housing formed of impervious walls, an elongate tubular porous base member disposed within said sealed chamber the walls of which are formed with axially spaced corrugations to enable the base member to be stretchable in the axial direction and bendable in all directions while militating against collapse to block the passage extending continuously through the base member, means for introducing blood into the sealed chamber for clotting onto the walls of the base member while confined within the sealed chamber, and means for gaining access to the interior of the chamber for removal of the base member after the blood has been clotted onto the walls thereof.

4,061,135

BINOCULAR ENDOSCOPE

Jerrold Widran, Glencoe, and Stuart A. Solin, Chicago, both of Ill., assignors to Jerrold Widran, Chicago, Ill.

Filed Sept. 27, 1976, Ser. No. 727,291
Int. Cl.² A61B *1/06*
U.S. Cl. 128—6 **25 Claims**

1. A binocular endoscope for obtaining three dimensional visual perception of an image of an object to be viewed, said endoscope comprising:

a pair of elongated, coextensive, juxtaposed optical systems for directing and guiding object-reflected light simultaneously through two paralleling substantially equivalent optical viewing paths delineated by an optic shaft extend-

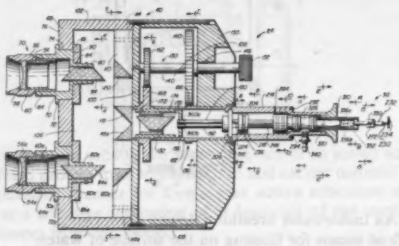
ing between the object viewed and a binocular viewing station,

said optical systems including

long path length lens means including means for focusing the image for viewing at the viewing station,

light path directing means operative to establish a parallax angle between the two viewing paths thereby to provide depth perception of the image of the object viewed,

ocular means for receiving and perceiving an image optically transmitted from the viewed object to the viewing station,



optic shaft means and means for rotatably shifting said optic shaft means relative to said ocular means of the endoscope to facilitate and effectuate continuously variable full-field viewing of an object to be examined, and

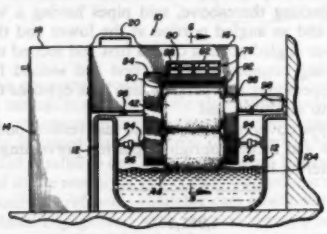
shift compensating optic means for maintaining an image of the object viewed in a disposition which is fixed as to angular spatial orientation relative to the viewing station irrespective of manipulative rotation of the optic shaft of the endoscope for selected field viewing.

4,061,136

PORTABLE WASHER AND MASSAGER APPARATUS FOR BATHTUBS

Giuseppe Vaniglia, 5205 W. 87th St., Oak Lawn, Ill. 60459

Filed Sept. 9, 1976, Ser. No. 721,959
Int. Cl.[2] A61H *29/00*
U.S. Cl. 128—24.1 **10 Claims**



1. Portable body washer and massager apparatus for use with a bathtub, said apparatus comprising:

an L-shaped enclosure defining an enclosed chamber therewith, said enclosure including;

a first enclosure portion extendable horizontally across the top of said bathtub at one end thereof,

a second enclosure portion depending downwardly from said first portion and extendable vertically adjacent a side wall of said bathtub, and

a top enclosure portion interconnecting said first and second portion, said top portion including a handle mounted thereon for readily removing said apparatus from said tub;

an elongated frame mounted coextensively with the bottom of said first enclosure portion, said frame including a pair of spacially separated extensions depending outwardly and downwardly from said elongated frame so as to project within said tub upon emplacement of said apparatus thereon;

a pair of roller brushes rotatably mounted between said pair of spacially separated extensions in substantially vertical alignment with respect to each other;

driven pulley means mounted to said elongated frame at one end thereof adjacent said second enclosure portion, and a first endless belt drivingly connecting said driven pulley means to said pair of roller brushes;

a motor mounted within said enclosed chamber at the bottom of said second enclosure portion substantially isolated from water splashes, said motor adapted for selective connection to an electrical power source;

a driver pulley rotatably mounted to said motor; and

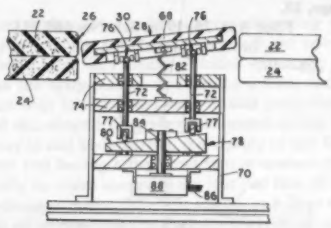
a second endless belt interconnecting said driver pulley and said driven pulley means for rotating said roller brushes during operation of said motor.

4,061,137

KINESITHERAPEUTIC BED STRUCTURE

Clayton Sandt, P.O. Box 243, Mt. Pocono, Pa. 18344

Filed Aug. 24, 1976, Ser. No. 717,216
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—33 **6 Claims**



1. A kinesitherapeutic bed structure comprising in combination:

a bed frame;

a coil spring assembly carried by said frame and adapted to support a person thereon, said coil spring assembly having an opening therein dimensioned to accommodate the upper vibratory element of a motion generating mechanism therewithin;

and a motion generating mechanism carried by said frame and including top and bottom plate elements reciprocable respectively in horizontal vertically spaced planes in mutually perpendicular directions, an upper vibratory element carried by said top plate element for reciprocatory movement therewith, and means for independently imparting horizontal reciprocatory movement to each of said top and bottom plate elements and vertical movement to said upper vibratory element.

4,061,138

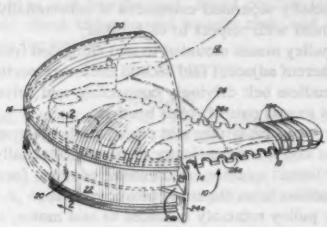
TOE PROTECTOR AND FOOT SUPPORT FOR AN ORTHOPEDIC CAST

Jacob Bernstein, 4840 Morse, Lincolnwood, Ill. 60646

Filed Aug. 12, 1976, Ser. No. 713,862
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—82 **7 Claims**

1. A one-piece toe protector and foot support apparatus for incorporation in a plaster cast comprising an elongated flat tongue having a forward portion and a rear end section, a leading edge on said forward portion having the asymmetric

shape of the outline of a human foot; a rim affixed to said leading edge and perpendicularly extending above and below



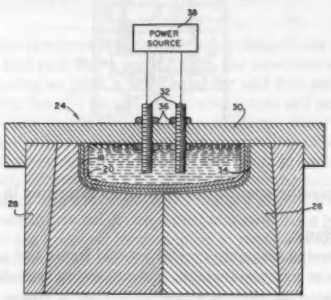
said edge forming toe protecting enclosures for either the right or left foot depending upon which said enclosure is used.

4,061,139

METHOD AND MEANS FOR PROVIDING PROTECTIVE CLOSURES FOR HIGH VELOCITY APPLICATIONS

J. H. Kauffmann, Park Ridge, Ill., assignor to F & B Mfg. Co., Chicago, Ill.

Filed Apr. 26, 1976, Ser. No. 680,293
Int. Cl.[2] B23K *21/02, 31/00*
U.S. Cl. 228—107 **9 Claims**



1. A fabricating process for forming and bonding a laminated protective closure for an open ended hollow structure by permanently bonding together and setting dissimilar materials, comprising the steps of:

a. Forming a first material undersized to the outside wall of said hollow structure and in the general configuration of the protective closure to be formed;

b. Forming a second material, comprised of higher physical properties than said first material, to the general configuration of the protective closure to be formed;

c. Slip-fitting said second formed material to said first formed material;

d. Permanently bonding said first material to said second material and setting said materials to the configuration of the protective closure to be formed by:

i. Placing said slip-fitted first and second materials in the proximity of a die of the protective closure to be formed;

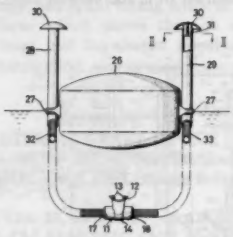
ii. Destroying the memory of both said slip-fitted materials by subjecting said slip-fitted materials to a high energy impulse force to force said first material against said second material and force both slip-fitted materials to assume the configurations of the die.

4,061,140

UNDERWATER BREATHING DEVICE

Masayasu Saito, No. 2-1 Higashibonoshima, Minoo, Osaka, Japan

Filed May 5, 1976, Ser. No. 683,524
Claims priority, application Japan, Feb. 2, 1976, 51-21384
Int. Cl.[2] A62B *7/00*
U.S. Cl. 128—145 A **1 Claim**



1. An underwater breathing device comprising:

a float means for floating on the surface of water;

a hollow tubular T-shaped mouthpiece having a central hollow vertical member and two hollow lateral cross-members joined to said vertical member on opposite sides thereof;

first and second tubes, each tube being inserted into and slightly projecting outwardly from one of said lateral cross-members, said tubes fitting into said cross-members in a water-tight relationship;

first check valve means in said first tube for opening toward said central vertical member only when air is inhaled through said vertical member;

second check valve means in said second tube for opening away from said central vertical member only when air is exhaled into said vertical member, whereby only one of said first and second valve means is open at one time;

a first flexible hose fitted into said first tube and extending therefrom;

a second flexible hose fitted into said second tube and extending therefrom;

first and second upright pipes connected to said float means and projecting thereabove, said pipes having a vertical portion and an angled portion at the lower end thereof, said lower angled portion of said first and second upright pipes being connected to said first and second flexible hoses respectively at the end of each hose opposite the end fitted into said tube; and

umbrella type cover means fitted into said vertical portion of said first and second upright pipes for preventing water from entering into said pipes.

4,061,141

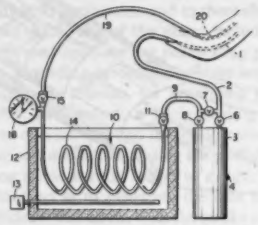
APPARATUS AND METHOD FOR SELECTIVELY SEPARATING AMINO ACIDS AND DEFINED PROTEINS IN BLOOD

Viktor Holger Hydén, Prastgardsgaten 2, and Fritz Victor Hasselblad, St. Eriks Torg 3, both of Goteborg, Sweden

Continuation-in-part of Ser. No. 850,576, Aug. 15, 1969, abandoned. This application Feb. 4, 1972, Ser. No. 223,577
Claims priority, application Sweden, Mar. 21, 1969, 4029/69
Int. Cl.[2] A61M *1/03*
U.S. Cl. 128—214 R **18 Claims**

1. An apparatus for selectively separating by enzymatic degradation amino acids and defined proteins from blood for therapeutic purposes, comprising walls forming a chamber, means positioned within said chamber forming at least one laterally closed and impervious passage therethrough, an inlet to said flow passage, an outlet from said flow passage a first tube for connecting said inlet to a human artery, a second tube for connecting said outlet to a human vein so that a closed

system is provided for withdrawing blood from an artery, passing it through the flow passage in said chamber and returning it to a vein, a carrier material disposed within said flow passage for direct contact with the blood flowing therethrough



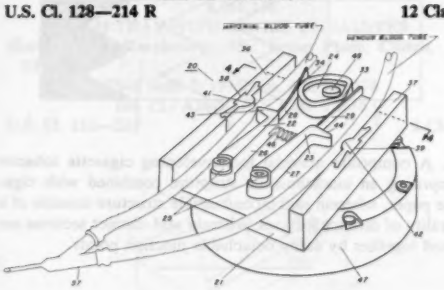
and an enzyme suitable for separating one of an amino acid or a defined protein from blood fixed to said carrier material in an insolubilized manner for forming an active substance which effects a selective separation of at least one of the particular substances from the blood.

4,061,142

APPARATUS FOR CONTROLLING BLOOD FLOW

Glenn L. Tuttle, Bountiful, Utah, assignor to Sandoz, Inc., E. Hanover, N.J.

Filed June 16, 1976, Ser. No. 696,734
Int. Cl.[2] A61M *1/03*
U.S. Cl. 128—214 R **12 Claims**



1. An apparatus for controlling blood flow through a pair of blood tubings in a single needle alternating blood flow system, which comprises in combination a support frame, a pair of pivotly mounted clamping arms connected to said frame and mounted parallel to one another, said arms having a leaf spring affixed to the non-pivot end of each clamping arm and extending axially therefrom, a rotatable cam positioned between and in slidable engagement with the leaf springs, and means for actuating the cam, whereby the cam moves the leaf spring-clamping arms to alternately occlude and non-occlude a blood tubing.

4,061,143

MEDICAL ADMINISTERING NEEDLE ASSEMBLY WITH FILTER MEANS

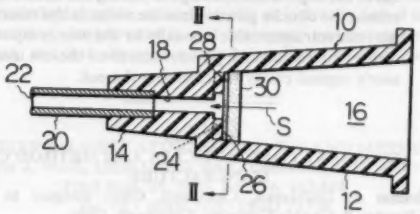
Soji Ishikawa, No. 8-5, 1-chome, Kamata, Setagaya, Tokyo, Japan

Filed June 10, 1976, Ser. No. 694,794
Int. Cl.[2] A61M *5/32*
U.S. Cl. 128—218 N **9 Claims**

1. A medical administering needle assembly having longitudinally aligned foremost and rearmost ends as regards the direction in which a fluid is to be forced to flow through the assembly when the assembly is in use, comprising:

a generally tubular body portion which is formed with a longitudinal passageway having an axis therethrough and open at the rearmost end of the body portion and which has a front end wall formed with an opening at the foremost end of the passageway, the front end wall having at the foremost end of the passageway an annular inner face having an outer circumferential end at the foremost end of the inner peripheral surface of the body portion and an inner circumferential end circumscribing the rearmost end of said opening, said end wall being further formed with a plurality of projections protruding rearwardly from said annular inner face and spaced apart from each another about said axis of the passageway in the body portion, said projections having respective rear end faces in a common plane substantially perpendicular to said axis;

a tip portion forwardly projecting from said front end wall and formed with a longitudinal passageway rearwardly



merging with said opening and communicating with the passageway in the body portion through the opening;

a first disc-shaped filter element located within the passageway in the body portion and having a front end face in contact with said rear end faces of said projections; and

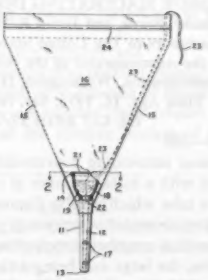
a second disc-shaped filter element located within the passageway in said body portion rearwardly of said first filter element and having a front end face in contact over substantially its entire area with the rear end face of said first filter element, each of the first and second filter elements having its outer peripheral surface closely received on the inner peripheral surface of said body portion and being formed with a multiplicity of voids, the first filter element being denser than the second filter element and the voids in the first filter element being smaller in size than the voids in the second filter element.

4,061,144

DISPOSABLE SYRINGE

Robert L. Strickman, 729 Handwerg Drive, River Vale, N.J. 07675, and Melvyn B. Strickman, Academy St., Shiloh, N.J. 08353

Filed May 10, 1976, Ser. No. 684,906
Int. Cl.[2] A61M *7/02*
U.S. Cl. 128—227 **2 Claims**



1. A disposable compact vaginal syringe comprising in combination the following:

a tubular nozzle having an axial passage therethrough,

the nozzle having a first end insertable into a vaginal cavity of a user and a second end connected in sealed engagement with a foldable flexible bag which is holdable in the user's hand and which encloses a reservoir,

the nozzle provided with a compartment in the second end thereof to store douche powder therein,

the axial passage communicating in flow series between the reservoir and at least one spray opening in the first end of the nozzle,

the bag provided with an opening whereby the reservoir is fillable with water,

the bag having a tongue in groove seal to close the opening,

at least one membrane enclosing the douche powder in the compartment,

a pull member connected to the membrane and extending out of the bag via the opening for tearing the membrane to release the douche powder into the water in the reservoir, the reservoir squeezable manually by the user to inject the water with the douche powder dissolved therein into the user's vaginal cavity for cleansing thereof.

4,061,145

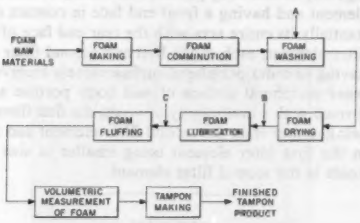
ABSORBENT FOAM ARTICLES AND METHOD OF MANUFACTURE

Thomas A. DesMarais, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 635,458, Nov. 26, 1975, Pat. No. 3,994,298, which is a continuation-in-part of Ser. No. 543,192, Jan. 22, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 727,090

Int. Cl.² A61F *5/44, 13/20*

U.S. Cl. 128—275 **6 Claims**



1. A living body fluid receptor comprising a body contacting means enclosing an absorbent, resilient particulate foam material which has been lubricated and treated with surfactant.

4,061,146

TISSUE MACERATING INSTRUMENT

Edward F. Baehr, Berea, and James E. Burnett, Cleveland, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 15, 1976, Ser. No. 677,353

Int. Cl.² A61B *17/32*

U.S. Cl. 128—305 **13 Claims**

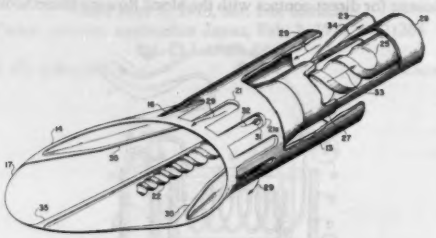
1. In a tissue macerating instrument of the type having a rotatable rod with a cutter member at one end, said rod being disposed in a tube which itself is disposed in an extension of a handle, the improvement comprising:

a frusto-conical member attached at its small end to said extension, the large end being a tissue engaging edge,

at least one aperture in said extension adjacent said frusto-conical member;

an annular intermediate wall extending longitudinally between the small end of said frusto-conical member and one end of said tube, and having

an inflow aperture in said intermediate wall in communication with said at least one aperture in said extension,



the interior of said tube being in communication with an outflow passageway.

4,061,147

COMPOSITE CIGARETTE ENVELOPING MATERIAL

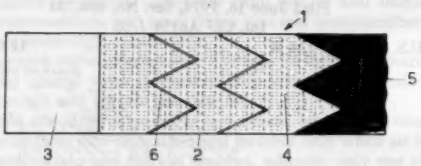
Ennio Falchi, V.le di Villa Pamphili, 37/B, Rome, Italy

Filed May 22, 1975, Ser. No. 580,469

Claims priority, application Italy, May 22, 1974, 51165/74

Int. Cl.² A24D *1/12*

U.S. Cl. 131—4 A **5 Claims**



1. A composite material for enveloping cigarette tobacco comprising an incombustible structure combined with cigarette paper, wherein said incombustible structure consists of a plurality of distinct sections, wherein said distinct sections are joined together by easily detachable junction points.

4,061,148

PERFORATING APPARATUS FOR ARTICLES

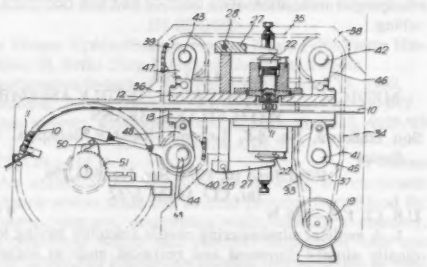
John Keith Goslin, Beeston, and Thomas Clifford Tomlinson, Tollerton, both of England, assignors to Imperial Group Limited, London, England

Filed Sept. 28, 1976, Ser. No. 727,693

Claims priority, application United Kingdom, Oct. 11, 1975, 41739/75

Int. Cl.² A24C *5/30*; B26D *9/00*

U.S. Cl. 131—23 R **6 Claims**



1. Apparatus for perforating a succession of cigars comprising:

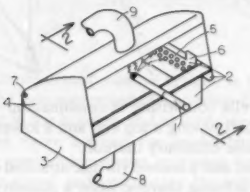
first and second opposing parallel plates which define a perforating position therebetween; conveyor means for conveying a succession of cigars to the perforating position; means for interrupting the travel of the cigars during perforation; means for causing the plates to hold each cigar during its perforation and to thereafter to release the perforated cigar, one of the plates including an aperture therein located opposite the perforating position; a stripper plate, extending across the aperture and provided with a guide passage therein, for separating each perforated cigar after perforation; a reciprocating perforator arranged to operate through the guide passage in the stripper plate; and means for causing the perforator to reciprocate along a line at right angles to a cigar in the perforating position so as to penetrate the side of the cigar and then withdraw therefrom with the stroke of the perforator being such that the perforator only partly penetrates the cigar; said stripper plate separating each perforated cigar from the perforator during the withdrawal stroke of the perforator.

4,061,149

ASH TRAY WITH SMOKE EXHAUSTER

Mark Bogdan Raczkowski, 55C Bruan Place, Clifton, N.J. 07012

Filed Sept. 7, 1976, Ser. No. 721,174
Int. Cl.² A24D *1/12*; A24F *13/16*
U.S. Cl. 131—231 **2 Claims**



1. An ash tray unit, for installation on a vehicle, comprising:
a housing with an open top and having a bottom or side opening;
a hood means movably mounted on said housing and having an opening in an upper portion thereof;
an ash tray insert with an open top, mounted inside of said housing and having numerous side openings in the upper portion thereof;
corner support means between said housing and said ash tray insert for supporting said ashtray on said housing and providing space therebetween;
an self exhauster means with a funnel inlet, said self exhauster having an inlet opening having a stone shield screen mounted thereon, an outlet opening, and inclined duct branch means extending between said inlet and outlet openings;
a top exhaust duct between said hood opening and one said duct branches a bottom exhaust duct between said housing bottom or side openings and said another of said duct branches, whereby smoke from a cigarette in said ashtray is exhausted from said housing through said self exhauster means by air passing through said inlet opening when the vehicle is in motion.

4,061,150

QUATERNARY AMMONIUM COMPOUNDS IN PRETREATMENT OF HAIR BEFORE SHAMPOOING WITH AN ANIONIC SHAMPOO

George F. Dasher, Inverness; Kathleen A. O'Cull, Northlake, and Thomas J. Schamper, Chicago, all of Ill., assignors to Alberto-Culver Company, Melrose Park, Ill.

Continuation-in-part of Ser. No. 538,891, Jan. 6, 1975, Pat. No. 3,980,091. This application July 29, 1976, Ser. No. 709,782
The portion of the term of this patent subsequent to Sept. 14, 1993, has been disclaimed.
Int. Cl.² A45D *7/00*; A61K *7/08*
U.S. Cl. 132—7 **15 Claims**

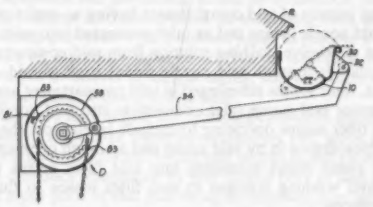
1. A method of treating hair to improve the manageability thereof, which comprises initially contacting the hair with a dilute aqueous composition containing a water-soluble quaternary ammonium compound containing at least one long chain aliphatic hydrocarbon radical directly or indirectly linked to a quaternary nitrogen atom in said quaternary ammonium compound, and then shampooing the hair with an anionic shampoo.

4,061,151

GUTTER MANIPULATING APPARATUS AND METHOD

Edwin J. Ward, 13839 Clifton Blvd., Lakewood, Ohio 44107

Filed Sept. 15, 1975, Ser. No. 613,444
Int. Cl.² B08B *7/02*; E04D *13/06*
U.S. Cl. 134—33 **20 Claims**



15. A method for manipulating a gutter to facilitate dumping of debris from the gutter, comprising the steps of:
a. supporting the gutter for rotation about a longitudinal axis of the gutter, said longitudinal axis being located within the gutter between its upper edge and its bottom whereby the radius of rotary motion of the gutter is less than its depth, and
b. imparting reciprocatory rotary motion to the gutter about the longitudinal axis in response to the application of power thereto in a continuous and uniform fashion.

20. Apparatus for manipulating a gutter to assist in dumping debris therefrom, comprising:
a. structure for mounting the gutter for rotative motion about a longitudinal axis of the gutter; and
b. rotation imparting structure connected to the gutter including:
i. a rotatable cranking element, and
ii. structure connecting the cranking element to the gutter and being responsive to rotation of the crank to rotate the gutter over an angular displacement substantially equal to that of the rotative motion of the cranking element.

4,061,152

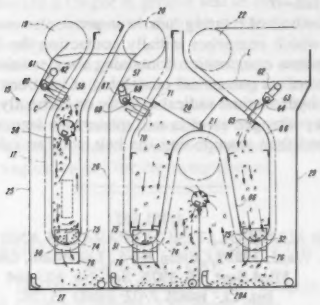
CONTAINER WASHING APPARATUS

Momir Babunovic, Des Peres, Mo., assignor to Barry-Wehmiller Company, St. Louis, Mo.

Continuation of Ser. No. 605,279, Aug. 18, 1975, abandoned. This application Dec. 10, 1976, Ser. No. 748,840
Int. Cl.² B08B *3/02, 9/08*
U.S. Cl. 134—73 **11 Claims**

1. Container washing apparatus comprising a washing solu-

tion containing compartment, container carrier conveyor means operable to carry containers in a loop path which is directed downwardly and then upwardly through said compartment, imperforate guide means in said compartment in position to be engaged by the containers in the downward and upward travel, said guide means being interrupted at a zone above the bottom of the loop path where said carrier conveyor and the containers will transverse the interruption, nozzle means disposed adjacent to said interruption in said guide means to deliver a flow of fluid to pass over the containers and through said carrier conveyor for flushing labels therefrom, a



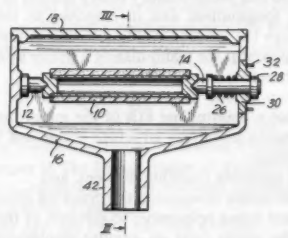
pump outside of said compartment having an outlet connected to said nozzle means and an inlet connected into said compartment to receive washing solution from said compartment and circulate it through said nozzle means back to said compartment, filter means submerged in said compartment and located to cover said pump inlet connection into said compartment, said filter means operating to exclude labels from the washing solution drawn in by said pump and a branch connection from said pump outlet extending into said filter means to return filtered washing solution to said filter means to flush labels therefrom.

4,061,153

PAINT ROLLER CLEANING APPARATUS

Thomas E. Doherty, 7 Carriage Lane, Setauket, N.Y. 11733

Filed Sept. 28, 1976, Ser. No. 727,462
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—138 **1 Claim**



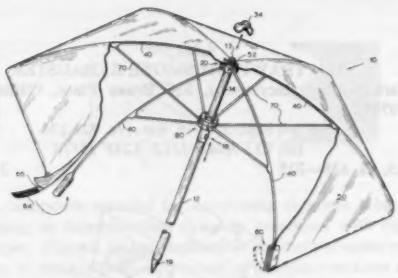
1. A paint roller cleaning arrangement comprising, in combination, a housing; bearing means within said housing for supporting rotatably a paint roller to be cleaned; cleaning fluid inlet means on said housing for admitting a stream of fluid into the interior of said housing to impinge on the surface of a roller; means for directing said stream onto said roller so that the force applied to the surface of the roller by the stream rotates the roller about said bearing means for exposing the full roller surface to said stream; said stream of cleaning fluid being directed along the full length of said roller simultaneously; centrally-located drain fluid drain means on said housing and communicating centrally with the interior of said housing for draining fluid therefrom after passing over the surface of said roller, fluid to be drained being collected centrally within the interior of said housing and being directed through said drain means; elongated rectangular — shaped orifice means on said inlet means and extending along the length of said roller when supported in said bearing means, said fluid passing through said orifice means prior to impinging on said roller; said bearing means including an axially slidable conically-shaped bearing member urged against one end of said roller by spring means; a threaded end cap supporting said bearing member and held within a threaded opening in one end of said housing; cover means on said housing for admitting said roller in the interior thereof and closing said housing prior to applying cleaning fluid to said roller; slot means in said threaded cap for admitting a handle attached to said paint roller; and closure means for sealingly covering said slot means for admitting said handle; said orifice means being mounted above the axis of rotation of said roller means on said bearing means and extending along substantially the full length of said roller.

4,061,154

UMBRELLA WITH INTERCHANGEABLE TOPS

James L. Cox, 4604 Arch Court, Orlando, Fla. 32808, and Jack M. Pippin, P.O. Box 254, Altamonte Springs, Fla. 32701

Filed May 6, 1976, Ser. No. 683,831
Int. Cl.[2] A45B *15/00, 25/18*
U.S. Cl. 135—34 **9 Claims**



1. An umbrella comprising in combination:
a vertical shaft having a top end and a lower end defined at the opposite extremity thereof;
a first rib disc and a second rib disc attached coaxially therewith for defining therebetween a plurality of rib ball receptacles each having a downwardly, outwardly and radially extending slot coupled thereto, with said first and second rib discs each having a central aperture coaxially therein for having said vertical shaft coupled therethrough adjacent said top end thereof;
a plurality of substantially equally spaced ribs each having a rib ball attached to one end thereof for movably coupling within one of said rib ball receptacles, with each of said ribs communicating through one of said radially extending slots for coupling within said first and second rib discs, whereby each of said ribs may collapsibly fold along and be extended from said vertical shaft;
a first support disc and a second support disc juxtaposed coaxially therewith for defining therebetween a plurality of support ball receptacles each having an upwardly and outwardly extending slot coupled thereto, within said first and second support disc each having a central aperture coaxially therein for movably receiving said first vertical shaft therethrough, whereby said first and second support discs move longitudinally along said vertical shaft as said umbrella is collapsibly folded;
a detachable cover coupled at a central portion thereof to said top end of said vertical shaft;
a plurality of support ribs for providing a bowing force on each of said ribs, with a first end of each of said support

ribs including thereon a support ball for being movably restrained within one of said support ball receptacles defined by said first and second support discs, a second end of each of said support ribs movably connected to one of said ribs intermediate said end of said ribs;

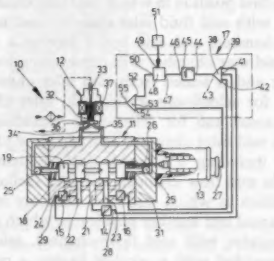
a detachable cover coupled at a central portion thereof to said top end of said vertical shaft;

a first fabric coupler attached to a distended end of each of said ribs and a second fabric coupler attached to a circumferential edge section of said attachable cover and extending radially beyond said edge section a sufficient dimension to be folded back under said distended end of one of said ribs, each of said first fabric couplers juxtaposed with and removably coupled to one of said second fabric couplers for stretching said detachable cover over said plurality of ribs.

4,061,155
ELECTROHYDRAULIC CONTROL SYSTEM

Klaus Sopha, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Apr. 7, 1976, Ser. No. 674,739
Claims priority, application Germany, May 28, 1975, 2523600
Int. Cl.² G05D *7/06*
U.S. Cl. 137—85 **3 Claims**

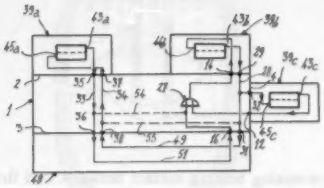


1. In an electrohydraulic control system, in combination, a way valve of the type comprised of a housing, fluid inflow and consumer ports in the housing, and at least one valve member movable in the valve housing for establishing connections between ports; positioning means operative for receiving an electrical input signal and positioning the valve member in dependence thereon; desired-value selector means for generating a desired-value signal indicative of a desired volumetric flow rate for the flow of fluid into the fluid inflow and out the consumer ports; transducers operative for sensing the position of the valve member and the pressures at the inflow and consumer ports and generating corresponding electrical feedback signals; and circuit means connected to the desired-value selector means and to the transducers and operative for compensating for the effect upon said volumetric flow rate of variations in the hydraulic loading of consumers supplied via the way valve by furnishing said electrical input signal to the positioning means as a predetermined function of both desired-value and feedback signals, the circuit means including a first difference amplifier having inputs connected to the outputs of respective ones of the pressure-sensing transducers, a square-root extractor having an input connected to the output of the first difference amplifier, a divider having a first input connected to the output of the square-root extractor and a second input connected to the output of the desired-value selector means, a second difference amplifier having a first input connected to the output of the divider and a second input connected to the output of the one of the transducers which senses the position of the valve member, the output of the second difference amplifier being connected to the input of the positioning means for furnishing said electrical input signal thereto.

4,061,156
TRANSITION MODULE FOR A PNEUMATIC SEQUENCER AND AN ASSOCIATED SEQUENCER

Jean Gachot, 26 bis, Avenue de Paris, Soisy-Sous-Montmorency, Val d'Oise, and Siméon Lekarski, 138, Boulevard de la Republique, Saint-Cloud, Hauts-de-Seine, both of France

Filed Mar. 15, 1976, Ser. No. 667,219
Claims priority, application France, Mar. 20, 1975, 75.08720
Int. Cl.² F16K *11/00*; F15C *3/00*
U.S. Cl. 137—109 **11 Claims**



1. A universal transition module for a pneumatic sequencer, in particular for a sequencer having a branched flow diagram, said module being intended to be assembled with three action modules, two of said action modules being located upstream and producing action in conjunction on the third action module located downstream, or one of said action modules being located upstream and producing action in disjunction on the both other action modules located downstream, each action module being provided with a control input to receive a control signal, an inhibition input to receive an inhibition signal and an output to deliver an output signal, said transition module being an integral block comprising:

an elementary logical gate for receiving two input signals by means of respective ducts terminated by two input ports of said gate, and for delivering one output signal by means of a one duct terminated by one output port of said gate, said input ports of said gate being so disposed as to receive the output signals of the both action modules located upsteam or of the two action modules located downstream, and said output port of said gate being so disposed as to deliver the output signal of said gate to the control input of the one action module located downstream or to the inhibition input of the one action module located upstream;

a Y-duct provided with one input port and two output ports so disposed to transmit the output signal of the one action module located downstream to the inhibition input of the both action modules located upstream, or to transmit the output signal of the one action module located upstream to the control inputs of the both action modules located downstream.

4,061,157
RECIPROCATING VALVE HAVING STEM CLEANING MEANS

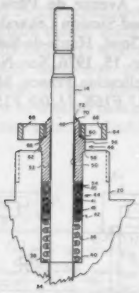
Albert J. Hanssen, North Kingstown, R.I., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 27, 1976, Ser. No. 652,672
Int. Cl.² F16K *41/00*
U.S. Cl. 137—242 **13 Claims**

1. In a valve of the type that has a body with a valve seat disposed therein, a valve member disposed in said body for engagement with the valve seat and a reciprocating valve stem attached to said valve member and having a portion exposed by extending out of the valve body, the improvement comprising:

first means fixedly mounted to the valve body and disposed about the valve stem at a position where said stem extends from said body for removing foreign matter from the exposed portion of the valve stem as the stem is reciprocated into the valve body; and

bearing means disposed between said first means and said reciprocating valve stem for providing a tight fitting



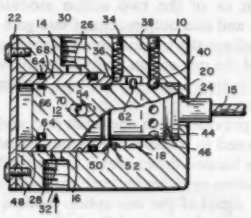
non-seizing bearing surface between said first means and the valve stem and for positioning said first means relative to the valve stem.

4,061,158

VALVE WITH COMBINATION LOCK AND REMOTE CONTROL

George J. Musial, 13 Townsend Road, Lynnfield, Mass. 01940

Filed Nov. 22, 1976, Ser. No. 744,034
Int. Cl.[2] F16K *37/00*
U.S. Cl. 137—552.5 9 Claims



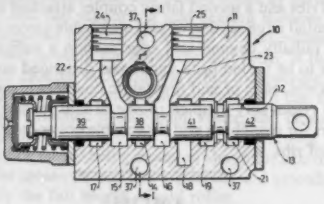
1. A combination lock and remote control valve comprising a valve body containing a valve chamber and spaced ports, an actuator and concentric telescopically mounted sleeve in the valve chamber, said actuator and sleeve containing openings adapted at times to be oriented with respect to said spaced ports in the valve body to provide for a continuous passage through the valve body, means for rotating the actuator and moving it axially in the chamber, said sleeve containing an internal axial groove, means normally releasably locking the sleeve in a predetermined position, a pin fixed to the actuator movable with the actuator in rotation to position it opposite said axial groove in the sleeve at said predetermined position and axially along said groove to disable said last means, said actuator being thereafter rotatable to effect rotation of the released sleeve to align the openings in the sleeve with said spaced ports, movable axially to lock the sleeve in its open position, rotatable to align the openings therein with the openings in the sleeve and, finally, axially to engage the pin with the sleeve to lock the several components in the open position of the valve.

4,061,159

HYDRAULIC VALVE

Kornelius Brakel, Schwieberdingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 8, 1976, Ser. No. 730,714
Claims priority, application Germany, Dec. 17, 1975, 2556708
Int. Cl.[2] F17D *3/00*
U.S. Cl. 137—596 10 Claims



1. A hydraulic valve, comprising a valve body having a fluid inlet chamber, a user chamber arranged for communication with a user of the fluid admitted into said valve body, a fluid return chamber for recovering fluid from the user, a flow channel arranged for communication with a source of fluid and with said fluid inlet chamber, and a passage connecting said chambers; a spool movably mounted in said passage, said spool having a first position in which said user chamber is in communication with said fluid inlet chamber and is sealed from said return chamber, and said spool having a spool position in which said user chamber is in communication with said return chamber and is sealed from said inlet chamber; and a valve element for selectively sealing said inlet chamber from said flow channel and for selectively providing communication between said inlet chamber and said flow channel, said valve element including a movable sealing member which is arranged in said flow channel, and said sealing member having one position in which said inlet chamber is sealed from said flow channel and another position in which said inlet chamber communicates with said flow channel, said sealing member being provided with a conduit having a pair of ends which open to said flow channel, and said sealing member having a face which is exposed to said flow channel so as to be subjected to the pressure acting in said flow channel, said valve element further including a biasing member biasing said sealing member towards said one position.

4,061,160

CONTROL VALVE

James S. Kashmer, Budd Lake, N.J., and Charles R. Tobin, Coopersburg, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 8, 1976, Ser. No. 730,906
Int. Cl.[2] F16K *11/22*
U.S. Cl. 137—637.2 12 Claims

1. A control valve comprising:

a manifold sleeve including a fluid inlet, a sensor outlet and a fluid outlet all of which link the interior of the manifold sleeve to the exterior thereof, said sleeve having a proximal and a distal end with the fluid inlet being located adjacent the distal end;

a hollow plug mounted in the distal end of said sleeve to seal it, the interior of said plug being in concentric alignment with the interior of said sleeve, said plug including a portion which extends longitudinally into the interior of the sleeve;

a hollow valve housing mounted on the proximal end of said sleeve to seal it, the interior of said housing being in concentric alignment with the interior of said sleeve;

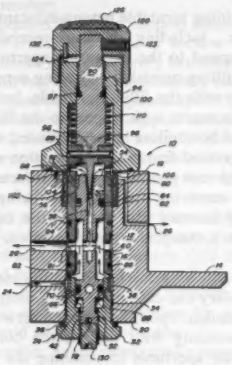
a first valve member, generally tubular in cross-section, which is reciprocally and concentrically mounted within said sleeve, in juxtaposition with the interior walls thereof, said valve member terminating proximate said fluid inlet

in a valve surface, said valve member also including a radial passageway proximate each of said sensor and fluid outlets;

a seating surface mounted on said longitudinally extending portion of said plug, which acts in conjunction with said valve surface and which, at one extreme of reciprocation of said first valve member, completely blocks flow through said inlet and which, at the other extreme of reciprocation, permits maximum flow;

a second valve member, mounted on said first valve member and linked thereto, for reciprocation therewith, said second member having a proximal portion extending into and mounted in said valve housing, and a distal axially extending tapered valve which terminates within the tubular portion of said first valve member;

a longitudinally extending valve slider mounted reciprocally and concentrically within said first valve member, said slider including, at one end, a seat portion which mates



with the tapered valve of said second valve member to control flow rate to said fluid outlet, and a terminal portion at the other end which is retained in the hollow plug, said valve slider further including passageways linking both said fluid inlet and said sensor outlet with said seat portion;

means for reciprocating the combination if said first and second valve members with respect to said manifold sleeve, between predetermined limits; and

means for reciprocally positioning the valve slider with respect to the first valve member to adjust the spacing between the tapered valve and the seat portion of said valve slider;

whereby whenever there is flow through the fluid inlet, the passageways in the valve slider providing a hydraulic control pressure at said sensor outlet and fluid to said seat portion for deliveryat adjustable flow rate to said fluid outlet.

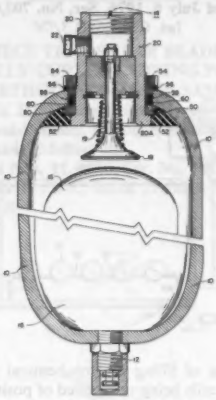
4,061,161

ANTI-EXTRUSION GROMMET ASSEMBLY FOR PRESSURE ACCUMULATOR LIQUID VALVE

Edward M. Greer, Beverly Hills, Calif., assignor to EMG Hydraulics, Inc., Santa Monica, Calif.

Filed Feb. 23, 1976, Ser. No. 660,365
Int. Cl.[2] F16L *55/04*
U.S. Cl. 138—30 **2 Claims**

1. A pressure accumulator including a rigid shell having a circular opening at one end thereof, and a valve assembly mounted in the opening, said valve assembly comprising: a tubular housing having an outer diameter less than the diameter of the opening and having a peripheral shoulder formed at the inner end thereof whose outer diameter is less than than the diameter of the opening; a retaining ring formed of a plurality of arcuate segments mounted coaxially with the tubular housing and configured to engage said peripheral shoulder thereof and to engage the inner surface of the shell around the opening; a resilient ring mounted concentrically with the inner end of the tubular housing and having an outer peripheral surface



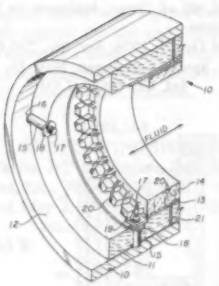
engaging the inner surface of the container, said retaining ring having a plurality of holes extending therethrough, and portions of said resilient ring extending into said holes to anchor said resilient ring to the arcuate segments of the retaining ring.

4,061,162

HIGH TEMPERATURE AND SHOCK RESISTANT INSULATED PIPE

Henry B. Jones, and Dorrance P. Bunn, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,786
Int. Cl.[2] F16L *9/14*
U.S. Cl. 138—147 **14 Claims**



1. A high temperature and shock resistant insulated pipe for transporting high velocity gas or fluidized solids comprising,

a. a pipe having an inner surface,

b. a batt of fiber felt secured to said pipe inner surface,

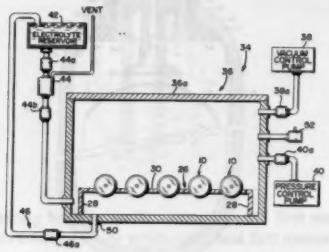
c. a high temperature resistant metal shield mounted contiguous with the inner surface of said fiber felt batt and secured to the pipe inner surface, and

d. an erosion resistant and metal reinforced castable refractory mounted contiguous with the inner surface of said high temperature resistant metal shield and secured to the pipe inner surface for providing a high temperature resistant and high mechanical strength insulated pipe.

4,061,163
METHOD OF FILLING ELECTROCHEMICAL CELLS WITH ELECTROLYTE

John J. Decker, and Charles R. Ricards, both of Emporium, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 6, 1976, Ser. No. 703,089
Int. Cl.² B65B 3/04
U.S. Cl. 141—7 7 Claims

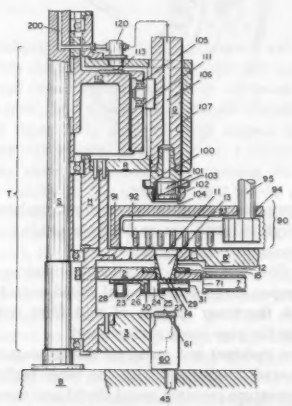


1. In a method of filling electrochemical cells with liquid electrolyte, said cells being comprised of positive and negative elements contained within a cell body which is provided with a fill port, the steps comprising: placing at least one of said cells in a controllable pressure chamber with said fill port down; evacuating said chamber to a first vacuum pressure below the boiling point of said liquid electrolyte for a first given period of time; increasing the pressure in said chamber to a second vacuum pressure above the boiling point of said electrolyte but below atmospheric; introducing a sufficient amount of electrolyte into said chamber to cover said fill port; increasing the pressure in said chamber to atmospheric; increasing the pressure to greater than atmospheric for a second given period of time; removing said remaining electrolyte by blowing from said chamber; venting said chamber to atmosphere; and removing said at least one cell.

4,061,164
POWDER FILLING MACHINE

Fumio Sato, Nishinomiya; Teruo Sakamoto, Hirakata; Seiichi Watashiro, Ikeda; Hayao Inoue, Osaka, and Yoshihito Yahata, Kawanishi, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Oct. 7, 1976, Ser. No. 730,447
Claims priority, application Japan, Nov. 13, 1975, 50-136727
Int. Cl.² B65B 1/04
U.S. Cl. 141—90 20 Claims



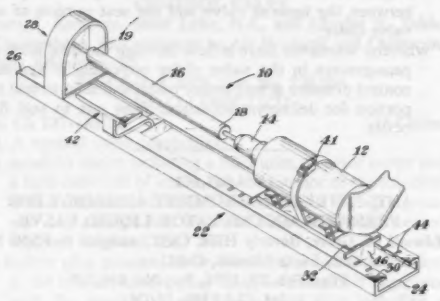
1. In the powder filling machine of the type wherein, (A) distribution of the powder to each of measuring-aperture aligned with constant spacings along a circle inside a circumference of a filling-turntable of flat surface rotatably supported around an upright center shaft mounted on a base of the machine of flat surface which also serves for carrying containers and equipped with a means for rotating the same, (B) measurement of the amount of the powder to be filled for a single shot, are performed by (a) forming a heap of powder into or around the aperture and then by (b) levelling off the heap with a reservoir for storing the powder mounted over the filling-turntable partly covering the surface of said turntable and having a closed side wall capable of (i) confining the powder within the reservoir and of (ii) levelling off the heap, and (C) sluicing-down of that measured amount of powder into an empty container placed underneath the measuring-aperture is effected by opening usually shut bottom outlet of the aperture in a timed sequence and in accordance with their angular position when they are in vertically aligned relationship, an improvement which comprises:

1. a measure-holding turntable having substantially the same configuration, including measure-receiving openings which correspond to the measuring-apertures, as the superimposing filling-turntable and being supported coaxial and rotatable with the filling-turntable, but permitted of vertical displacement with respect to the filling-turntable;
2. a plurality of bottomless inner measures, each having a hollow of inverted frusto-conical section and a straight outer stem, the root portion of which is secured by each of said measure-receiving openings and the upper portion is telescopically inserted into each of the measuring-apertures to form a composite measure of varying capacity, and
3. a means for adjusting the height of the measure-holding turntable to vary the capacity of said composite measure which is dependent upon the distance between the turntables, simultaneously with that of the container placed underneath the apertures to combine the mouth of the container with the bottom of the aperture.

4,061,165
PORTABLE TOOL

William James Harwood, Saginaw, and Robert P. Snyder, Bay City, both of Mich., assignors to William James Harwood, Saginaw, Mich.

Filed Aug. 16, 1976, Ser. No. 714,363
Int. Cl.² B27C 9/00; B23D 67/00; B23B 3/28
U.S. Cl. 144—1 R 9 Claims



1. A portable apparatus for reducing the dimensions of a workpiece using rotatable work means comprising in combination:

a. a portable electric drill motor having a shaft-receiving chuck;
b. a journalled support member;
c. a working element support;
d. work means rotatable about its longitudinal axis and ter-

minating at each of first and second ends in a portion extending in the axial direction and supported respectively by said chuck and by a journalled support member;

e. a guide member having supported thereon said electric drill motor;

f. a channelled base member having a first end and a second end and adapted to receive and adjustably support (1) adjacent the first end thereof said guide member, (2) adjacent the second end thereof said journalled support member, and (3) between said guide member and said journalled support member said working element support;

g. means for assuredly fixing each of said guide member, journalled support member, and working element support a predetermined distance along said base member;

said base member having mutually opposed inwardly extending flanges extending longitudinally along each lateral edge of a face of said base member;

said guide member being slidable longitudinally of said base member whereby the drill motor supported thereon is adjustably positionable with respect to the journalled support member;

said guide member having a support member having generally an inverted "U" shape in section with longitudinal edges terminating in outwardly extending flanges adapted to cooperatively engage the inwardly extending flanges of said base member; two spaced-apart U-shaped support brackets attached to said support member adjacent each end thereof, for holding in a cradle-like arrangement said drill motor; compression means extending through each of said support brackets for selectively adjusting the spatial separation between upstanding arms of said support brackets to adapt to the curvature and dimensions of a variety of portable electric drill motors and to permit the leveling of said portable electric drill motor so that the axis of said motor extends along a line substantially parallel to the plane of said base member; fastening means attached to said support member for securing said drill motor to said guide member; and

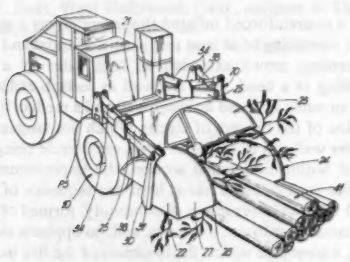
said base member being substantially coextensive with the combination of the guide member and said journalled support member.

4,061,166

FLAIL DELIMBER

Robert W. Larson, P.O. Box 1148, Thunder Bay, Ontario, Canada (P7C 4X9)

Filed Nov. 1, 1976, Ser. No. 737,480
Int. Cl.² B27L *1/00*
U.S. Cl. 144—2 Z **11 Claims**



1. Apparatus for delimbing trees comprising:

a. a mobile self-propelled vehicle;

b. two or more flail delimber units disposed side-by-side and each individually movably mounted on said vehicle for movement in a vertical plane;

c. means connected to said vehicle and to said flail delimber units for raising and lowering the same independent of one another; and

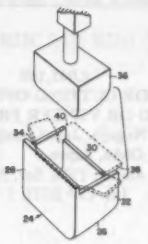
d. sensing means controlling said raising and lowering means to automatically maintain a selected relative position between the respective flail delimber units and trees lying on the ground being processed during movement of the vehicle longitudinally along the trees to thereby maximize impact forces of the flail members on the limbs being removed.

4,061,167

SINGLE PIECE TRI Σ SHEAR BLADE HAVING CYLINDRICALLY CURVED CUTTING PORTION AND METHOD OF MAKING SAME

James Knox Dunn, III, Dubuque; Lee Everett Tucker, Eldridge, and Andrew Paul Redman, Dubuque, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 11, 1976, Ser. No. 741,288
Int. Cl.² B21D *17/02;* B21K *21/00;* A01G *23/08*
U.S. Cl. 144—34 E **10 Claims**



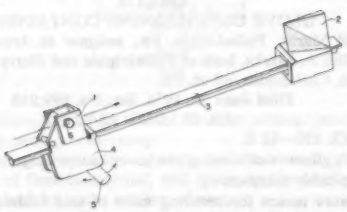
1. The method of making a tree shear blade having a cylindrically curved cutting portion, comprising: the steps of shaping a blank from a metal plate so as to have a central blade portion adapted for passing through a tree being sheared, first and second tab portion respectively at opposite ends of the central blade portion and a third tab portion at one side of the central blade portion; sharpening a second side of the central blade portion opposite from said one side thereof to form a cutting edge; placing the blank on a die shaped for causing the pair of tabs to be bent towards each other to form upright ends of the blade, for causing the third tab to be bent to form an upright back plate extending between the pair of tabs and for causing the central blade portion to become cylindrically curved; engaging the blank with a press foot, configured for moving the blank against the die and thereafter causing the press foot to so move the blank; removing the shaped blank from the die; and welding the tabs together.

4,061,168

LOG SPLITTING DEVICE

James Douglas Fariss, Jr., Wilmington, Del., assignor to Innovation Enterprises, Inc., Wilmington, Del.

Filed May 3, 1976, Ser. No. 682,725
Int. Cl.² B27L *7/00*
U.S. Cl. 144—193 R **3 Claims**



1. A device for splitting logs comprising the following combination:

a. jack means comprising a jack post and jacking mechanism; and

b. a platform block mounted upon said jacking mechanism and attached thereto, said platform block having one face to contact one end of a log to be split; and

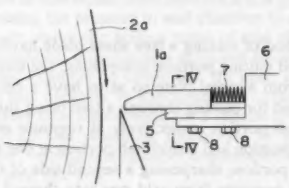
c. a wedge block fixedly attached to said jack post having a wedge with apex facing said platform block in which said wedge apex forms an acute angle with said jack post, said acute angle opening toward said platform block, to prevent said log from disengaging at the wedge block during splitting, such that, when said log to be split is inserted with one end thereof contacting said platform block and the other end thereof contacting said apex of said wedge block, and said jack means are actuated forcing said platform block toward said wedge block, said log is split.

4,061,169

APPARATUS FOR CUTTING OFF A THICKNESS OF WOOD OR VENEER FROM LOGS

Katsuji Hasegawa, Nagoya, Japan, assignor to Meinan Machinery Works, Inc., Ohbu, Japan

Filed Aug. 2, 1976, Ser. No. 710,468
Int. Cl.² B27L 5/02
U.S. Cl. 144—213 **5 Claims**



1. In an apparatus for cutting off a thickness of wood or veneer from a wooden loglike member, said apparatus having a tangential knife for cutting the wooden member and a pressing device positioned ahead of the cutting edge of said knife, the improvement wherein said pressing device comprises a plurality of pressing members, resilient means individually urging each of said pressing members into engagement with the surface of said wooden member, each said pressing member comprising a roller, and means associated with each said roller for making small cuts on the surface of the wooden member, said means comprising a plurality of edged members provided on the peripheral surface of each said roller.

4,061,170

GLOVE CONDITIONING CONTAINER

Arnold Marks, Philadelphia, Pa., assignor to Arnold Marks; Judith A. Marks, both of Philadelphia and Harry E. Livingston, Cheltenham, all of, Pa.

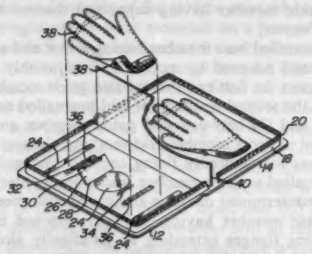
Filed June 23, 1976, Ser. No. 699,018
Int. Cl.² B65D 65/02
U.S. Cl. 150—52 R **11 Claims**

1. A glove conditioning container comprising:

a foldable member;

closure means for securing sides of said foldable member together;

controlled ventilation means disposed to permit a controlled amount of air to reach the area formed within the sides of said foldable member when said member is in its folded position; and



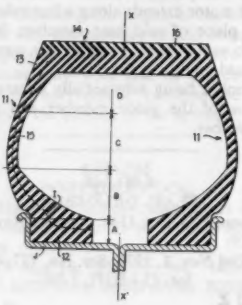
restraining means for a pair of gloves to permit said gloves to be positioned within the confines of said foldable member.

4,061,171

NONREINFORCED TIRE

Jacques Boileau, Clermont-Ferrand, and Albert Mathevet, Chamalieres, both of France, assignors to Compagnie Generale des Etablissements Michelin, France

Filed June 7, 1976, Ser. No. 693,967
Claims priority, application France, June 12, 1975, 75.18481
Int. Cl.² B60C 5/00, 13/00, 15/00
U.S. Cl. 152—352 R **31 Claims**



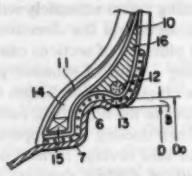
1. In a nonreinforced inflated tire mounted on a wheel rim, said tire consisting of at least one elastic material and having a tread-forming crown extended on both sides by a sidewall terminating in a bead, each sidewall as seen in radial section having an outer wall and an inner wall and a median line which is the line of the centers of circles which are tangent both to said outer wall and to said inner wall, each circle being entirely included within said radial section, the improvement which comprises each sidewall has at least one sequence of zones A, B, C, D without interruption of continuity, formed of a zone C of substantially constant thickness, and, on opposite sides of the zone C, a zone B in which the thickness of the tire increases as it moves away from the zone C, the thickness of this zone B at its end opposite zone C being at least two times the thickness of the zone C, and a terminal zone D in which the thickness of the tire increases as it moves away from the zone C, the ratio of the increase in thickness of the zone D per unit of length of the median line being less than the ratio of increase in thickness of the zone B per unit of length of the median line, and finally a terminal zone A following the zone B and whose maximum thickness is equal to at least the greatest thickness of the zone B, said median line having a reversal of curvature which is located in a zone B.

4,061,172

ASSEMBLY OF PNEUMATIC TIRE AND RIM

Akira Yoshida, Itami; Taketoshi Kubo, Nara; Mashayuki Yamajo, Izumi, and Masahiro Ishigaki, Ibaragi, all of Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Continuation of Ser. No. 523,949, Nov. 14, 1974, abandoned.
This application Mar. 10, 1976, Ser. No. 665,481
Claims priority, application Japan, Nov. 14, 1973, 48-128059
Int. Cl.² B60C *15/02, 13/00*
U.S. Cl. 152—379.1 4 Claims



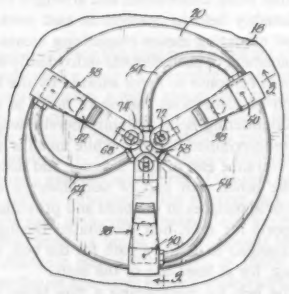
1. In a pneumatic tire and wheel assembly comprising: a tire including a tread and a pair of sidewalls extending radially inwardly therefrom on each side thereof and terminating in bead areas and a wheel rim comprising: an axially directed rim base, bead seats extending axially from said rim base to each side thereof and terminating in radially outwardly directed rim flanges, the improvement wherein said pneumatic tire comprises at least one unitary ring-formed projection axially outside of the wheel rim and adjacent the rim flange and including a first portion projecting radially inwardly of said rim flange such that when the tire has an inner air pressure of 0 and is under no load, the half difference between the minimum diamter of the ring-formed projection at said first portion and the outer diameter of the rim flange ranges from about 2 to 7 mm, said tire ring-formed projection further including a second, rigid portion radially beyond said rim, said second portion comprising a rubber compound having a 100% modulus of elasticity of about 30 to 70 kg/cm², and wherein a reinforcing material extends in a circumferential direction of the tire and lies within said ring-formed projection, second rigid portion, at a position radially and axially outwards of said rim flange.

4,061,173

TIRE SERVICING APPARATUS

Robert V. Daly, West Hollywood, Calif., assignor to The Coats Company, Inc., La Vergne, Tenn.

Filed Dec. 29, 1976, Ser. No. 755,185
Int. Cl.² B60C *25/12*
U.S. Cl. 157—1.17 6 Claims



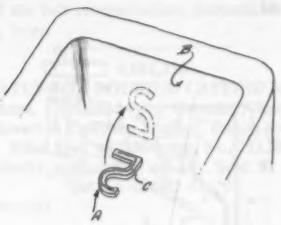
1. In a tire servicing apparatus the combination of:
a base;
a wheel support including clamps movable between wheel rim gripping and non-wheel engaging positions;
a shaft rotatably journalled on said base and mounting said wheel support for rotation on said base;
means for rotating said shaft;
a plurality of nozzles, one for at least some of said clamps, mounted on the associated clamp for movement therewith; and
means, including a conduit in said shaft, for directing air under pressure to said nozzles.

4,061,174

FIXING OF SHAPED BODIES TO METAL CASTING MOULDS

Bryan William Edwards, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Filed Nov. 1, 1976, Ser. No. 737,792
Claims priority, application United Kingdom, Dec. 5, 1975, 50025/75
Int. Cl.² B22C *9/00*; B22D *7/00*
U.S. Cl. 164—6 11 Claims



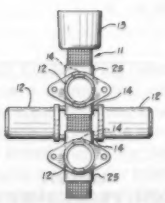
1. A method of fixing a shaped body of a refractory material to an interior face of an ingot mould, which method comprises applying to at least one of said body and said face a mixture consisting essentially of aqueous alkali metal silicate and a particulate refractory material, the mixture having a viscosity of at least 2000 poises measured on a Brookfield Viscometer model RVT at 20° C, and urging together said body and said face.

4,061,175

PATTERN ASSEMBLY AND METHOD OF MAKING THE SAME

Claude H. Watts, Mayfield Heights, Ohio, assignor to Precision Metalsmiths, Inc., Cleveland, Ohio

Filed July 19, 1976, Ser. No. 706,775
Int. Cl.² B22C *7/00*
U.S. Cl. 164—45 6 Claims



3. A pattern set-up for use in the lost pattern process of investment casting comprising:
a. a sprue member including a tube and a surrounding sleeve made of flexible material, said sprue member being provided with an outer coating of wax,
b. a plurality of preformed, thin bands assembled around said sleeve at spaced locations along its length, and
c. a plurality of workpiece patterns attached to said bands,

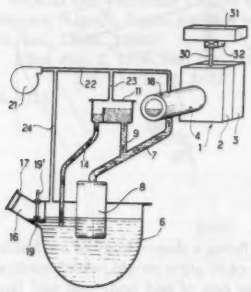
d. said bands being made of an expendable pattern material and having a thickness sufficient to prevent flexing of said sleeve.

4,061,176

FLUID-TIGHT COLD-CHAMBER PRESSURE CASTING APPARATUS

Henri Carbonnel, Antony, France, assignor to Groupement pour les Activites Atomiques et Avancees "GAAA" S.A., Le Plessis-Robinson, France

Filed July 26, 1976, Ser. No. 708,449
Claims priority, application France, Aug. 8, 1975, 75.24830
Int. Cl.[2] B22D *17/14*
U.S. Cl. 164—61 **7 Claims**



1. In a method for rapid casting of molten metal comprising the step of pumping molten metal through an ascending pipe from a closed crucible containing molten metal by a pump at least partially immersed in said molten metal to an injection cylinder connected to a mold at a level above said crucible, and determining the level of molten metal in the injection cylinder by a level determining tank fluid connected by way of a return pipe to the crucible and to the ascending pipe, the improvement comprising: maintaining a common vacuum pressure above the molten metal within the crucible, the level-determining tank and the injection cylinder during pressure casting until at least the molten metal has cooled in the mold.

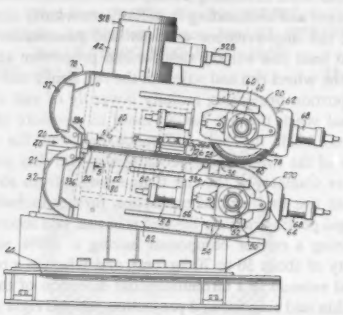
4,061,177

APPARATUS AND PROCEDURE FOR THE BELT CASTING OF METAL

Olivo Giuseppe Sivilotti, Kingston, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Apr. 15, 1975, Ser. No. 568,312
Int. Cl.[2] B22D *11/06, 27/16*
U.S. Cl. 164—87 **15 Claims**

1. An apparatus for the continuous casting of metal in strip form comprising a pair of movable heat-conducting belts defining therebetween a mold space extending over a predetermined distance from an extrance end of said mold space where liquid metal enters to an exit end where the metal traveling with the belts has become cast strip, means for guiding the belts along predetermined paths through said distance, said guiding means for at least one of the belts comprising at least several sections of guiding structure disposed in succession to each other along said distance and having belt-facing areas thereby collectively covering the reverse surface of said one belt adjacent to the mold space, at least a plurality of said sections having mounting means adjustably settable to locate the section individually over a range of positions toward and away from the guiding means for the other belt, said adjustably settable means comprising means separately settable at least for the two ends of each section in the direction of belt travel, whereby each of said plurality of sections can be set to guide the adjacent belt along a path of selected position, and of selected direction in a range from parallelism through various degrees of taper, relative to the other belt, each of said several sections consisting of belt cooling and supporting means for a predetermined area of said reverse surface of said one belt, including a multiplicity of guiding elements distributed over said area crosswise and lengthwise of the belt path and constituted in a multiplicity of crosswise rows each containing a



multiplicity of said elements, said elements of each of said several sections being disposed to lie collectively in a predetermined surface facing said reverse belt surface, and said elements of at least the last one of said sections in the direction of belt travel having mounting means whereby each element is individually displaceable in a direction away from the mold space, said section being constructed and arranged so that each element is releasably held in position in said predetermined surface and said mounting means comprising means yieldable to permit displacement of each element individually away from the mold space in response to force exerted by the belt.

11. A method of continuous casting of metal in strip form between heat-conducting belts defining therebetween a mold space over a predetermined distance while metal is introduced as liquid at an entrance end of said distance and discharged as cast strip at the other, exit end of said distance and while cooling the reverse surfaces of the belts and providing a multiplicity of supports for each belt distributed throughout said distance and arranged to define a path for the belt, the procedure comprising, for at least one of the belts:

a. cooling the belt by maintaining a thin layer of rapidly flowing liquid coolant over the reverse surface of the belt as a bearing layer between said reverse surface and said supports;

b. exerting force on said one belt independent of metal in the mold space to urge the belt firmly against the bearing layer and through it against the supports, along a first zone extending from the entrance to not further than an intermediate point of said distance, being a zone where the metal is still essentially fluid;

c. exerting little or no force independent of metal in the mold space on the belt toward the supports, through a second zone of said distance, where there are coherent shells of solidified metal adjacent to the belts, extending from the first zone toward the exit at least to a point where the metal behaves essentially as a solid, so that the bearing layer of flowing liquid coolant affords soft compliance, by compression of said layer between the belt and the supports; and

d. yieldably loading each support individually toward the mold space, while controlling said loading for yield of each support locally upon exertion of outward force by the belt substantially greater than the outward force on the belt at the first zone, through a third zone of said distance, including a terminal zone where the metal behaves essentially as a solid, extending to the exit from said second zone or from an earlier point in said distance.

4,061,178

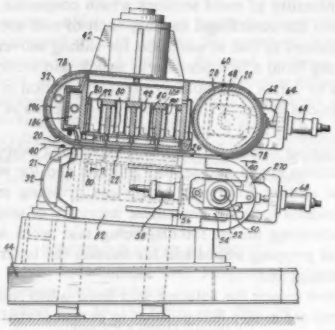
CONTINUOUS CASTING OF METAL STRIP BETWEEN MOVING BELTS

Olivo Giuseppe Sivilotti; David Edward Steer, and Thomas Adrian Cheetham Stock, all of Kingston, Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Apr. 15, 1975, Ser. No. 568,320

Int. Cl.² B22D *11/06, 27/16*

U.S. Cl. 164—87 **25 Claims**



1. An apparatus for the continuous casting of metal in strip form comprising a pair of movable heat-conducting belts, defining therebetween a mold space, said apparatus including, at each of the opposite sides of said mold space, means for guiding the adjacent belt along a desired path, each said means having a multiplicity of closely spaced belt-guiding faces distributed over a predetermined area of the belt path and lying in a desired surface adjacent to the reverse face of the belt for defining the said path, each guiding face having a central jet aperture for directing liquid coolant against the belt, cooling means comprising means for supply of liquid coolant under pressure to the jet apertures and for withdrawal of liquid coolant from the belt, said apparatus being constructed and arranged so that each belt can be urged outwardly of the mold space into substantial conformity with said desired surface, and said guiding and cooling means being constructed and arranged so that liquid coolant flows outward from each jet of the faces along the belt, forming a liquid coolant layer spacing the belt from said faces in said conformity therewith.

22. In a method of continuous casting of metal in strip form between movable heat-conducting belts defining therebetween a mold space along which the belts travel, while metal is introduced as liquid at one end of said space and discharged as cast strip at the other, exit end, the procedure of guiding and cooling the belts along said space comprising: providing at the reverse surface of at least one belt a multiplicity of supports which are distributed over an area to be guided and cooled, and having guiding faces collectively lying in a surface to define a path for the belt, projecting liquid coolant under pressure through apertures in said faces against said reverse surface of the belt while withdrawing said coolant at a multiplicity of localities respectively closely adjacent to the faces, said projecting and withdrawal of coolant being controlled to provide liquid rapidly flowing on the reverse surface of the belt, across each entire guiding face from the aperture thereof to said directly adjacent localities, for maintaining a layer of liquid coolant in rapid flow over substantially the entirety of said area of the belt reverse suface, between said surface and the guiding faces.

4,061,179

APPARATUS FOR POURING CASTING MATERIAL

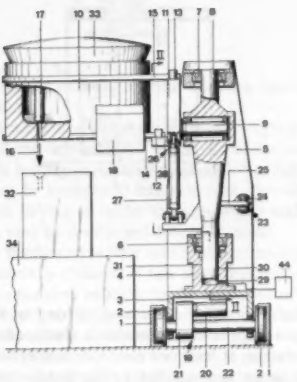
Horst Gillhaus, Dortmund-Loh, Germany, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Sept. 13, 1976, Ser. No. 722,526

Claims priority, application Germany, Sept. 27, 1975, 2543168

Int. Cl.² B22D *41/12*

U.S. Cl. 164—151 **8 Claims**



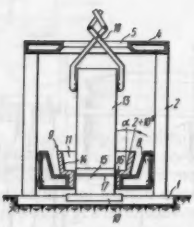
1. Casting apparatus for delivering casting material to mold means arranged upon a casting line comprising transport means for moving said apparatus along a path extending generally parallel to said casting line, ladle means adapted to have said casting material stored therein for delivery to said mold means, a vertical column mounted for rotation about a vertical axis, a cantilever mounted at one end thereof on said vertical column for rotation about horizontal axis and having a free end at the opposite end thereof, fork means on said free end of said cantilever, and outrigger means on said ladle adapted to engage said fork means for mounting said ladle upon said fork means, said vertical column being arranged to extend vertically upwardly from said transport means, said apparatus further including pressure sensitive weighing means arranged to extend to between the lower part of said column and said transport means.

4,061,180

INSTALLATION FOR ELECTROSLAG MELTING OF HEAVY-WEIGHT METAL INGOTS

Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 9, kv. 21; Boris Izrailevich Medovar, bulvar Lesi Ukrainki, 2, kv. 8; Vitaly Mikhailovich Baglai, ulitsa Semashko, 10, kv. 54/3; Jury Vadimovich Latash, ulitsa Artema, 55, kv. 23; July Georgievich Emelyanenko, ulitsa Darvina, 5, kv. 5; Leonid Mikhailovich Stupak, Brest-Litovskoe shosse, 39, kv. 9; Jury Fedorovich Alferov, bulvar Lepse, 29, kv. 64; Oleg Petrovich Bondarenko, ulitsa Kreschatik, 15, kv. 34; Grigory Bentsionovich Schupak, ulitsa Chudnovskogo, 7, kv. 61; Lev Andreevich Shuruev, ulitsa Gagarina, 10/2, kv. 7, all of Kiev; Kim Moiseevich Khasin, ulitsa K. Marxa, 35, kv. 17, Novosibirsk; Jury Fedorovich Frolov, ulitsa K. Marxa, 8/2, kv. 70, Novosibirsk; Valery Vasilievich Salmin, ulitsa Zorge, 95, kv. 69, Novosibirsk; Vladimir Ivanovich Lugovsky, ulitsa Pamirskaya, 48, kv. 70, Novosibirsk; Vilen Fedorovich Marjuschenko, ulitsa Televizionnaya, 11, kv. 7, Novosibirsk; Fedor Fedorovich Shaburov, ulitsa Rimskogo-Korsakova, 4, kv. 64, Novosibirsk, all of U.S.S.R.; Jury Andreevich Schelkunov, deceased, late of Novosibirsk, U.S.S.R., by Margarita Petrovna Schelkunova, administratrix, ulitsa Akademika Komarova, 19a, kv. 87, Moscow, U.S.S.R.

Filed June 23, 1976, Ser. No. 699,172
Int. Cl.[2] B22D *23/06*
U.S. Cl. 164—252 3 Claims



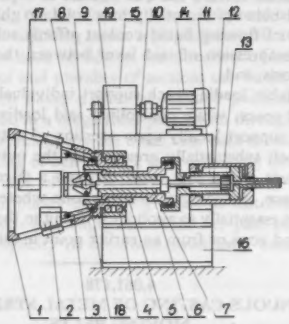
1. An installation for electroslag melting of heavy-weight metal ingots by melting consumable electrodes comprising: vertical columns; at least one electrode holder secured on the vertical columns and adapted to fix therein one or several consumable electrodes and to feed electric current to them; a cooled mould positioned below the electrode holder and mounted for possible vertical displacement along the vertical columns and having a through cavity whose clear cross section in a slag bath zone is larger than a clear cross section in an ingot forming zone and, the latter cross section is substantially close in value to the cross-section area of one or several of the consumable electrodes being simultaneously melted; a cooled bottom plate having a vertical cooled protrusion, the cooled protrusion partially entering the cavity of the cooled mould from underneath and forming the bottom of the cooled mould at the beginning of melting, and being of a height exceeding a height of the ingot forming walls of the cooled mould and of a cross section allowing the cooled mould to be lowered to such a level at which the ingot forming section of the wall of the cooled mould is below the upper end face of the cooled protrusion; and a drive for displacing the cooled mould in vertical direction.

4,061,181

APPARATUS FOR CENTRIFUGAL CASTING IN SPLIT MOLDS

Jan Ficek, Zabrze, Poland, assignor to Przedsiebiorstwo Projektowania i Wyposazania Zakladow Przemyslu Maszyn i Aparatow Ekejtrtczbtcg "Promel", Gliwice, Poland

Filed Feb. 7, 1977, Ser. No. 766,496
Claims priority, application Poland, Feb. 11, 1976, 187182
Int. Cl.[2] B22D *13/10*
U.S. Cl. 164—292 6 Claims



1. Apparatus for centrifugal casting in split molds comprising:

a. a rotatable head having the configuration of a hollow frustum of a cone, said head being provided with a plurality of elongated slots extending along the generatrices thereof;

b. a plurality of mold sections which cooperate to define a mold for centrifugal casting, each of said sections being mounted in one of said slots for sliding movement therealong from a first position in which said sections cooperate to define said mold to a second position in which said sections are separated from one another so as to expose a casting formed in said mold;

c. gripping means for gripping the casting when said mold sections are in said second position and for withdrawing the casting from said head, said gripping means being mounted for axial movement interiorly of said head;

d. activating means for displacing said mold sections and said gripping means and for causing the latter to grip the casting; and

e. drive means for rotating said head when said mold sections are in said first position to permit centrifugal casting with said head.

4,061,182

LOW-PRESSURE CASTING APPARATUS

Adolf Diez, Bad Friedrichshall II, Germany, assignor to Karl Schmidt GmbH, Neckarsulm, Germany

Continuation of Ser. No. 559,474, March 18, 1975, abandoned.
This application July 30, 1976, Ser. No. 709,997
Claims priority, application Germany, Apr. 8, 1974, 2417102
Int. Cl.[2] B22D *17/02, 17/26*
U.S. Cl. 164—309 1 Claim

1. In low-pressure casting apparatus which comprises

holding furnace means for a molten metal bath, said furnace means having cover means and sidewalls and being adapted to be closed gas tight and supplied with gas under pressure;

ingot mold means positioned on top of said furnace means and including base plate means carried by the cover means of said furnace means and core cover plate means having attached to the underside thereof core means;

riser pipe means adapted to be immersed in said metal bath

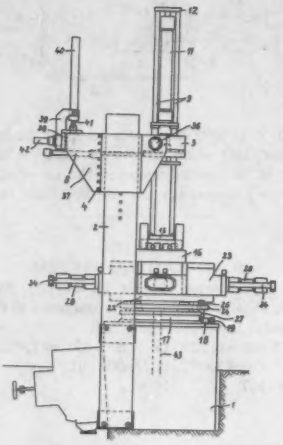
and communicating with the base plate means of the ingot mold means;

a plurality of upright tension rods adapted to vertically move the core cover plate means of said ingot mold;

two opposite, upright flat members positioned to the rear of the sidewalls of said furnace means;

horizontal bridge means mounted between said upright flat members;

said bridge means having a U-shaped slot in which is horizontally slidably mounted tension means, and said bridge



means having means to horizontally move said tension means;

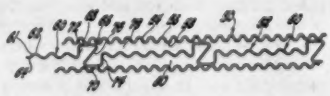
the improvement which comprises bracket means vertically adjustably mounted on said upright flat members, horizontal pivot pin means mounted on the forward portions of the bracket means, the bridge means being pivotally mounted on the pivot pin means for pivotal movement thereabout, a cross-beam connecting the bracket means and carrying a bearing bracket, a hydraulic actuator for the pivoting movement and pivoted in said bearing bracket, and means on said cross-beam for locking said bridge means in operative position.

4,061,183

REGENERATOR MATRIX

Leonard C. Davis, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 16, 1977, Ser. No. 769,228
Int. Cl.[2] F28D *19/00*
U.S. Cl. 165—8 **3 Claims**



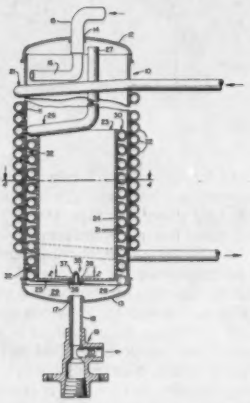
1. A sheet matrix for a gas turbine engine regenerator disc comprising first and second sheets spirally wound to form a disc, said first sheet having first corrugations formed transversely thereacross with a predetermined pitch dimension, said second sheet having corrugated segments formed transversely thereof at spaced axial points of said second sheet, said second sheet having spacers with parallel segments engageable with the peaks of said first corrugations on adjacent spirally wound portions of said first sheet, each of said parallel segments having a length greater than that of the pitch dimension of said first corrugations to prevent nesting of adjacent wraps of the spirally wound first and second sheets, each of said spacers further including a transversely formed portion defining a first side wall of a flow passage through said first and second sheets, each of said spacers including a second side wall on the opposite side of said passage from said first side wall.

4,061,184

HEAT EXCHANGER FOR A REFRIGERATED WATER COOLER

Richard J. Radcliffe, Gahanna, Ohio, assignor to EBCO Manufacturing Company, Columbus, Ohio

Filed Oct. 28, 1976, Ser. No. 736,506
Int. Cl.[2] F28D *7/10*
U.S. Cl. 165—38 **6 Claims**



1. Apparatus for exchanging heat between two fluid mediums comprising:

a. a hollow metallic tank having a generally cylindrical outer side wall and opposite end walls, one of the end walls of said tank having an inlet through which a first fluid medium may be introduced into said tank, the other of said end walls having an outlet through which said first fluid medium may be discharged from said tank;

b. a baffle positioned within said tank and having an elongated generally cylindrical side wall disposed in inwardly spaced concentric relation to the side wall of said tank, and arranged normally to direct said first fluid medium toward the side wall of said tank during passage thereof through said tank;

c. a first tubular conduit positioned within said tank and having an inlet portion opening toward the inlet end of said tank, an outlet portion opening toward the outlet end of said tank, and an intermediate helical portion disposed between and in pressure-fitted heat exchange contact with each of the side walls of said baffle and said tank, said first conduit defining within itself a first passage for conducting a portion of said first fluid medium from the inlet to the outlet of said tank, the intermediate helical portion of said conduit having relatively spaced apart convolutions defining with the side walls of said baffle and said tank a second, relatively separated, spiral passage for conducting another portion of said first fluid medium from the inlet to the outlet of said tank; and

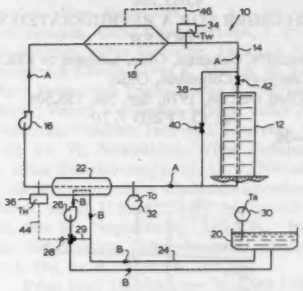
d. a second tubular conduit helically wound about and disposed in heat exchange contact with the outer surface of the side wall of said tank for conducting a second fluid medium in heat exchange relation to the outer side wall of said tank.

4,061,185

TEMPERATURE CONTROL SYSTEM

John Faiczak, Toronto, Canada, assignor to Canada Square Management Ltd., Toronto, Canada

Division of Ser. No. 579,342, May 21, 1975, Pat. No. 3,998,267.
This application Mar. 4, 1976, Ser. No. 663,584
Claims priority, application Canada, May 16, 1975, 227215
Int. Cl.[2] F25B *29/00;* F16L *5/00*
U.S. Cl. 165—48 9 Claims



1. Apparatus for controlling the temperature in a building having a temperature control circuit containing a building heat transfer load, heat energy storage means, and a circulating temperature control fluid for transferring heat energy between the fluid and the building load, the apparatus comprising:

a. means for measuring the amount of heat energy in the fluid and for determining the existing available energy to be transferred between the fluid and the building load;

b. means for predicting the amount of heat energy required to be transferred between the fluid and the building load over a predetermined interval;

c. an energy transfer unit located in the control circuit between the storage means and the building load, said transfer unit being adapted to vary the heat energy in the fluid;

d. means coupled to said transfer unit for controlling the output of said transfer unit, so that if said existing available energy to be transferred is less than said energy required to be transferred, the transfer unit varies the heat energy of the fluid in the control circuit at a rate of variation such that the total available energy to be transferred is at least equal to said energy required to be transferred over said predetermined interval; and

e. means located in the control circuit for controlling the circulation of fluid so that said existing available energy to be transferred is dissipated at a rate proportional to the difference between the rate of transfer of energy between the fluid and the building load, and said rate of variation by the transfer unit.

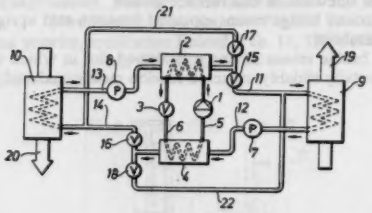
4,061,186

COMBINED COOLING AND HEAT RECOVERY SYSTEM

Ake Ljung, Soderkoping, Sweden, assignor to AB Svenska Flaktfabriken, Stockholm, Sweden

Filed Mar. 10, 1976, Ser. No. 665,545
Claims priority, application Sweden, Mar. 21, 1975, 75033142
Int. Cl.[2] F24F *7/00;* F24J *3/04;* F28D *15/00;* F28F *27/02*
U.S. Cl. 165—59 5 Claims

1. A system for cooling and heating ventilation air flowing through supply-air ducts and spent-air ducts comprising a heat exchanger in each of said ducts, fluid circuit means interconnecting said heat exchangers, said fluid circuit means including a refrigerating machine having an evaporator component connected to one of the heat exchangers and a condenser component connected to the other heat exchanger, said components operable respectively, when said machine is operating, to cool and to heat the fluid passing therethrough, and valve means connected to each component to alternatively direct the fluid from said component either back through the associated heat exchanger or to the other heat exchanger, whereby when said valve means is in the first position heat is transferred from the supplied air to the evaporator by said one heat exchanger, and



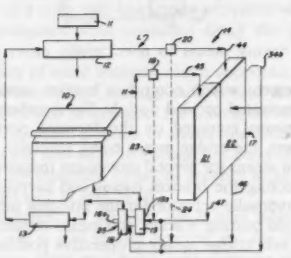
is transferred from said condenser to spent air by said other heat exchanger, and when said valve means is in the second position heat is transferred between the supplied air and the spent air by the heat exchangers and said fluid circuit.

4,061,187

DUAL COOLING SYSTEM

Ramanujam Rajasekaran; Dennis O. Taylor, and James W. Whittlesey, all of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Apr. 29, 1976, Ser. No. 681,492
Int. Cl.[2] F28D *15/00;* F01P *3/12*
U.S. Cl. 165—107 7 Claims



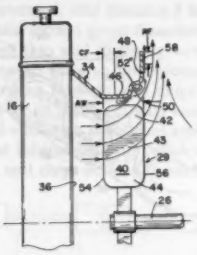
1. A dual cooling system for circulating coolant along discrete paths while maintaining the coolant in said paths at predetermined temperature and pressure differentials, said system comprising segregated circuits for the coolant; coolant circulating pump means including a housing defining a pump chamber in each circuit, a rotatable partition means encompassed along its annular periphery by a segment of said housing extending axially of the axis of rotation of said partition means at a greater radial distance from the said axis that the annular periphery of said rotatable partition means, said rotatable partition means being in at least partial registration with said housing segment and cooperating therewith to form a common partition intermediate said chambers, said common partition having a restrictive passage defined between the annular periphery of said rotatable partition means and the encompassing housing segment for limited coolant migration between said chambers in a direction substantially parallel to the axis of rotation of said partition means, impeller means extending into said chambers from opposite surfaces of said partition means to effect coolant circulation within said circuits at the predetermined temperature and pressure differentials when said partition means is rotated; means to effect rotation of said partition means; heat exchanger means disposed within each circuit; and coolant make-up means common to said circuits and connected to a suction side of each pump chamber to replenish any coolant migrating between said chambers, whereby said rotatable partition means is adapted to be positioned within said housing

alone a predetermined axis of rotation, and the restrictive passage between said rotatable partition means and said housing segment separating said coolant circuits while permitting rotation of said rotatable partition means within said pump housing.

4,061,188
FAN SHROUD STRUCTURE

Harold D. Beck, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 543,714, Jan. 24, 1975, abandoned, which is a continuation of Ser. No. 470,787, May 17, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,355
Int. Cl.² F28F *13/06*; F01P *7/10*; F03D *11/00*
U.S. Cl. 165—122 **16 Claims**



1. A fan shroud structure for use with a rotary, axial flow fan having a plurality of circumferentially spaced, radially extending impeller blades, said blades having an effective axial width (AW) measured axially along the rotational axis of the fan between a first plane and a second plane, said planes being axially spaced and parallel with respect to each other and disposed substantially normal to the rotational axis of the fan, said first and second planes extending radially, respectively through points on the leading edges of the blades at the radial tip portions thereof and through points on the trailing edges of the blades at the radial tip portions thereof, the combination including said fan, comprising,

a generally cylindrical axially extending throat section encircling the fan;

an annular generally radially extending flat portion, said flat portion being radially spaced outwardly and axially from one axial end of said throat section;

an annular intermediate section extending between said one axial end of said throat section and said radial flat portion, said throat section, intermediate section, and said radial flat portion being effective to produce a low pressure region between the air stream flowing over the surface thereof and such surface when the fan is in operation; and

an annular supplementary low pressure vortex creating means formed in said throat section, intermediate section and radial flat portion of the fan shroud structure whereby an additional low pressure region is generated between the air stream flowing over the surface of the fan shroud structure and such fan shroud structure surface when the fan is in operation.

9. A fan shroud structure for use with a rotary, axial flow fan having a plurality of circumferentially spaced, radially extending impeller blades, said blades having an effective axial width (AW) measured axially along the rotational axis of the fan between a first plane and a second plane, said planes being axially spaced and parallel with respect to each other and disposed substantially normal to the rotational axis of the fan, said first and second planes extending radially, respectively, through points on the leading edges of the blades of the radial tip portions thereof and through points on the trailing edges of the blades at the radial tip portions thereof, comprising,

a generally cylindrical axially extending throat section encircling the fan;

an annular, generally radially extending flat portion, said flat portion being radially spaced outwardly and axially from one axial end of said throat section;

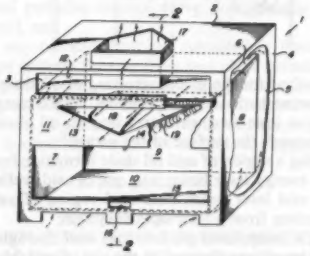
an annular, radially and axially curved, intermediate section extending between said one end of said throat section and said radial flat portion, said throat section, intermediate section, and said radial flat portion being effective to produce a low pressure region between the air stream flowing over the surface thereof and such surface when the fan is in operation, and the following relationships exist: RF = AW/3 plus or minus 12 percent of AW, CF = AW/3 plus or minus 12 percent of AW, and R = 2AW/3 plus or minus 12 percent of AW where RF is the radial length of the radial flat portion, CF is the axial length of the cylindrical throat section, and R is the radius of curvature of the intermediate section; and

an annular supplementary low pressure vortex creating means formed in said throat and intermediate section, and radial flat portion of the fan shroud structure such that an additional low pressure region is generated between the air stream flowing over the surface of the fan shroud structure and such fan shroud structure surface when the fan is in operation.

4,061,189
VORTICAL FLOWAEROTHERMODYNAMIC HEAT EXCHANGER

Alexander J. Moncrieff-Yeates, 8609 Hillside Place, Fairfax, Va. 22030

Division of Ser. No. 570,798, April 23, 1975. This application Sept. 29, 1976, Ser. No. 727,703
Int. Cl.² F28F *3/12*
U.S. Cl. 165—168 **22 Claims**



1. Means for exchanging heat between a thermally donative gas and heat exchange surfaces, said means including a donative gas flow path defined at least in part by said heat exchange surfaces and further including:

a source of heat donative gas, means including an exhaust passage for inducing flow of said donative gas through said flow path generally toward said exhaust passage, means for initially diverting at least a portion of the total volume of said donative gas flow to a vortex pattern area, structural means only partially defining said vortex area, said structural means comprising additional flow diverting elements comprising at least part of said heat exchange surfaces effective to remove heat and thus increase the density of said gas proximate to said last mentioned surfaces of said flow diverting elements and thus establish a density gradient across said diverted gas stream to a low pressure area spaced from said diverting elements, said flow diverting elements further effective with said pressure gradient to direct said portion of said gas in a reentrant flow direction away from the confinement of said structural means in an open flow toward said flow path, said gas in said reentrant flow direction being pulled toward said initially diverted gas flow and being further diverted by the induced gas flow to complete a circumferential flow pattern around a low pressure central axis, said

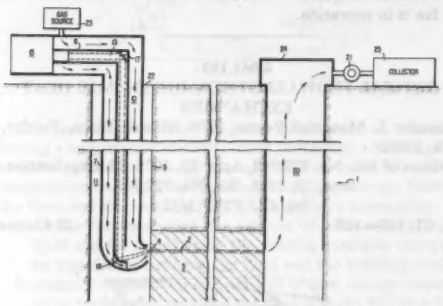
pattern being free to expand and contract in said open flow path in accordance with the velocity thereof, and means establishing communication with said exhaust passage for drawing gas axially from said vortex pattern area to maintain a stable vortical flow within said area and in proximity to said heat exchange surfaces, whereby the path of said donative gas and the time of residency of said donative gas in proximity to said surfaces are prolonged throughout varying temperature and velocity conditions thereby to enhance heat exchange therewith.

4,061,190

IN-SITU LASER RETORTING OF OIL SHALE

Harvey S. Bloomfield, Bay Village, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 28, 1977, Ser. No. 763,753
Int. Cl.² E21B *43/24*
U.S. Cl. 166—259 **8 Claims**



1. A method for the in-situ retorting of oil shale and recovery of gaseous hydrocarbon products, which comprises:
drilling at least two wellbores into an oil shale formation underneath the surface of the ground;
fracturing a region of said oil shale formation by directing a high energy laser beam into one of said wells and focussing said laser beam onto said region of said oil shale formation from a laser optical system;
forcing a compressed gas into said well through which said laser beam was directed to the site of said fracture which supports combustion in the flame front ignited by said laser beam in the fractured region of said oil shale, thereby retorting said oil shale; and
recovering gaseous hydrocarbon products which permeate through said fractured oil shale into the bore of a well adjacent the well through which said laser beam is directed.

4,061,191

METHOD FOR GASEOUS SAND CONSOLIDATION TREATMENT OF WEAK GAS SANDS

Franciscus H. Meijs, and David R. Davies, both of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed June 18, 1976, Ser. No. 697,491
Claims priority, application United Kingdom, Mar. 12, 1976, 9995/76
Int. Cl.² E21B *43/00, 43/02*
U.S. Cl. 166—292 **10 Claims**

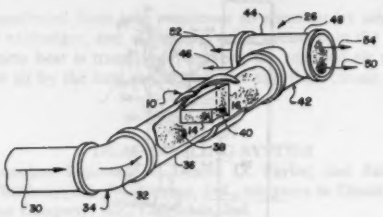
1. A process for increasing the rock strength of a water-wet gas-producing reservoir which is susceptible to impairment by liquid blocking and is or is likely to become unconsolidated, comprising:
adjusting the water content of the reservoir to the extent necessary to provide a significant but small proportion of water on the rock surfaces;
mixing a vapor of a silicon polyhalide having a water reactivity substantially equivalent to that of silicon tetrachloride with a substantially inert gas; and
injecting the mixture into the reservoir to convert a significant proportion of the rock-wetting water to a rock strengthening silica gel in the region around the well without unduly reducing the effective permeability of the reservoir.

4,061,192

FIRE EXTINGUISHING AGENT DISTRIBUTING DEVICE

John M. Cholin, 143 Polifly Road, Hackensack, N.J. 07601, and Rodger R. Cholin, Old Stone Hill Road, Pound Ridge, N.Y. 10576

Filed Mar. 29, 1976, Ser. No. 671,575
Int. Cl.² A62C *35/00*
U.S. Cl. 169—16 **5 Claims**



1. A fire extinguishing agent steering device for high speed fluidic fire extinguishing systems for extinguishing a fire hazard comprised of a change of flow means, a conduit upstream of said change of flow means having a twisted channel for reorienting the flow of fire extinguishing agent and expellant gas to assure equal division of the flow into said change of flow means thereby provide homogeneous fire extinguishing agent distribution at the fire hazard, said conduit having said channel with an oblonged cross-sectional exit end, having its major axis angularly rotated from the major axis of the entrance end; and, an oblonged cross-sectional central section interposing the entrance end and the exit end with its major gradually increasing angularly from the major axis of the entrance end and the major axis of the exit end, the major axis of the central section coinciding with each of the major axes of the entrance end and the exit end at their respective locations.

4,061,193

METHOD AND APPARATUS FOR DIGESTING CELLULOSE MATERIAL WITHOUT SCREENING DIGESTING LIQUID WITHDRAWN THROUGH THE DIGESTER TOP

Oliver A. Laakso, and Michael I. Sherman, both of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

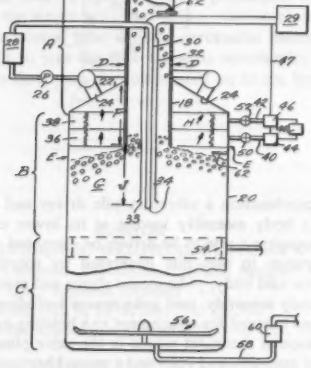
Continuation-in-part of Ser. No. 613,554, Sept. 15, 1975, abandoned. This application Feb. 20, 1976, Ser. No. 659,638
Int. Cl.² D21C *3/24, 7/14, 1/00*
U.S. Cl. 162—19 **7 Claims**

1. Apparatus for continuous digestion of cellulose material chips comprising
a cylindrical vertically disposed impregnation vessel having a first given diameter, an inlet at the top thereof, and an outlet at the bottom thereof,
means for introducing cellulose material chips and digesting liquid at relatively low temperature into said impregnation vessel inlet,
a cylindrical vertically disposed liquid-filled digesting vessel having a second given diameter, greater than said first given diameter, a top, and having a digesting zone and other treatment zones therein, the area of said impregnation vessel outlet being approximately ¼–½ as great as the area of said digesting vessel,

said impregnation vessel extending through the top of said digesting vessel, concentric therewith, a predetermined distance so that said impregnation vessel outlet is disposed a significant distance below the top of said digesting vessel, a chips column formed in said digesting vessel below the outlet from said impregnation vessel by chips entering said digesting vessel from said impregnation vessel outlet,

a liquid outlet formed in the top of said digesting vessel, a substantial distance above said impregnation vessel outlet and above said chips column,

means for introducing digesting liquid at relatively high temperature into said cellulose material chips column at a point a distance J below said impregnation vessel outlet great enough so that even distribution of liquid through said chips column results and so that short-circuiting of liquid to said liquid outlet formed in the top of said digesting vessel is prevented, said distance J being equal to or greater than ¼ said second given diameter, the quantity of liquid introduced into said digesting vessel and the first and second diameters being so dimensioned that the velocity of liquid flowing through said chips column to said digesting vessel outlet is substantially less than the velocity of liquid that entrains a significant amount of cellulose material, so that substantially no cellulose particles pass upwardly from said chips column to said liquid outlet,



means for withdrawing treated cellulose material from the bottom of said digesting vessel at a given rate so that the chips column is maintained at substantially the same level while individual particles thereof move downwardly through said vessel, and

means for removing any particles entrained in liquid passing from said chips column to said digesting vessel top outlet from said liquid, said means comprising a pair of vertically arranged screens, one atop the other, disposed on generally vertical side walls of said digesting vessel above said chips column and below said liquid outlet, and means for alternately applying suction to one of said screens and not the other to withdraw liquid from said digesting zone while particles are screened out.

5. A method for continuously digesting cellulose material in a vertical digester having an impregnation zone defined by an impregnation vessel having a first diameter, and a digesting zone and subsequent treatment zones defined by a digesting vessel having a second diameter substantially larger than said first diameter, said impregnation vessel extending downwardly into said digesting vessel a significant distance, and an outlet being disposed in the top of said digesting vessel above the outlet of said impregnation vessel into said digesting vessel, and the area of said impregnation vessel outlet being approximately ⅛–½ as great as the area of said digesting vessel, said method comprising the steps of

introducing cellulose material and digesting liquid at relatively low temperature into said impregnation vessel at the top thereof, said material and liquid passing downwardly through said impregnation vessel toward said digesting vessel.

introducing chips-liquid mixture from said impregnation vessel into said digesting vessel through said impregnation vessel outlet so that the chips form a chips column in said digesting vessel, the highest point of which is at said impregnation vessel outlet,

introducing digesting liquid at a relatively high temperature into contact with chips at a point a distance J below said impregnation vessel outlet great enough so that even distribution of liquid through said chips column results and so that short-circuiting of liquid to said liquid outlet formed in the top of said digesting vessel is prevented, said distance J being equal to or greater than ¼ said second given diameter,

withdrawing liquid flowing through said chips column from said digesting vessel through said liquid outlet disposed at the top of said digesting vessel without straining at said liquid outlet, the quantity of liquid introduced into said digesting vessel and the first and second diameters being so dimensioned that the velocity of liquid flowing through said chips column to said digesting vessel outlet is substantially less than the velocity of liquid that entrains a significant amount of cellulose material in its flow so that substantially no cellulose particles pass upwardly from said chips column to said liquid outlet,

withdrawing treated cellulose material from the bottom of said digesting vessel at a given rate so that the chips column is maintained at substantially the same level while individual particles thereof move downwardly through said vessel, and

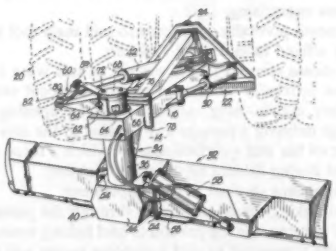
removing any particles that are entrained in liquid above said chips column flowing from said chips column to said digesting vessel top outlet from said liquid by alternatively applying suction to one of two screens disposed on generally vertical digesting vessel walls between the chips column top and said liquid outlet while not applying it to the other screen.

4,061,194

TRACTOR MOUNTED SCRAPER BLADE

James Edson McCanse, Oregon, Ill., assignor to Hesston Corporation, Hesston, Kans.

Filed Mar. 4, 1976, Ser. No. 663,670
Int. Cl.² A01B *59/043;* E02F *3/85*
U.S. Cl. 172—447 **3 Claims**



1. In a material handling assembly;

a swingable boom;

a first unit for swinging the boom in opposite directions;

an elongated scraper blade having means pivotally supporting the same on the boom for swinging movement therewith and with respect thereto;

a second unit;

a coupling between the second unit and the blade for swinging the latter in opposite directions relative to the boom during actuation of the second unit, to and from a position placing its longitudinal axis in perpendicular relationship to the normal course of travel of said assembly in all positions of swinging movement of the boom, and for placing said axis substantially parallel to said course when the boom is swung toward either end of its path in swinging movement,

said units each comprising a first and a second double acting fluid pressure piston and cylinder means, each provided with a reciprocable piston rod extending from one end thereof,

each cylinder having a pair of fluid receiving lines, one communicating with the rod end thereof and the other communicating with the piston end thereof, said lines being adapted for connection with a source of fluid under pressure;

manually operable valving coupled with said lines for controlling the flow of said fluid to and from each end of each cylinder respectively; and

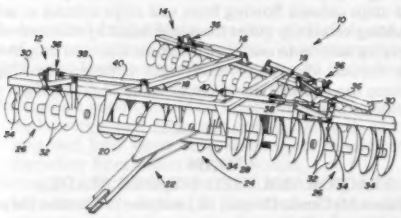
relief valving coupled with said lines for bypassing fluid between the cylinders when the resistance to swinging movment of the boom or the blade in either direction exceeds a predetermined amount.

4,061,195

LOCK AND LIFT MECHANISM FOR A FOLDABLE IMPLEMENT

Joseph E. Pryor, Athens, Tenn., assignor to Austin Industries, Inc., Dallas, Tex.

Filed Jan. 30, 1976, Ser. No. 653,965
Int. Cl.[2] A01B *63/32, 65/02*
U.S. Cl. 172—456 **9 Claims**



1. In an implement having a central tool bar and at least one wing tool bar pivotally connected to said main tool bar for pivotal movement between a folded and an extended position, a lock means comprising:

a hinge means pivotally connected to said main tool bar and rigidly affixed to said wing tool bar;

housing means secured to one surface of said wing tool bar in close proximity to the end portion adjacent said main tool bar, said housing means having an opening therethrough defining a passageway parallel to the axis of said wing tool bar and a surface against which a force may be exerted during folding of the wing tool bar;

activating means secured to said implement;

T-shaped linking means extending through the passageway of said housing, the leg portion of said linking means being pivotally connected to said activating means and the top portion of said linking means extending to either side of the passageway and positioned to abutt the surface on the housing mean when said linking means is being retracted by said actuating means to effect folding of said wing tool bar;

first guide means secured to at least one side portion of said wing tool bar in close proximity to its end portion adjacent said main tool bar, said guide means having an opening therethrough defining an elongated passageway along the axis of said wing tool bar;

second guide means secured to at least one side portion of said main tool bar in close proximity to said first guide means, said second guide means having an opening therethrough defining a passageway which is aligned with the passageway of said first guide means when said wing tool bar is in an extended position; and

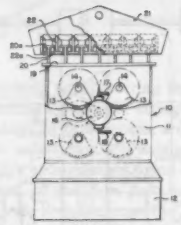
pin means pivotally secured to the other end portion of said linking means, said pin means slidably positioned within the passageway of said first guide means so that upon activation of said activating means said pin is caused to slidably pass into the passageway of said second guide means when said lock is in a locking position and to be slidably withdrawn therefrom when in an unlocked position.

4,061,196

RESILIENT YOKE MOUNTINGS FOR VIBRATORY PILE DRIVERS AND EXTRACTORS

Alvin E. Herz, Lakeland, Fla., assignor to L. B. Foster Company, Coraopolis, Pa.

Filed Aug. 30, 1976, Ser. No. 718,877
Int. Cl.[2] E02D *7/18*
U.S. Cl. 173—49 **7 Claims**



1. In combination a vibratory pile driver and extractor including a body assembly having at its lower end engaging means engaging a pile to be driven or extracted and transmitting vibration to said pile generated by rotating eccentric weights on said body, yoke means above and movable relative to said body assembly, said yoke means including at its upper part means adapted for attachment to a hoisting cable, a pair of first horizontal abutment means in the same plane on each of said body assembly and yoke and a second horizontal abutment means on the other of said body assembly and yoke, said first and second horizontal abutment means being spaced apart vertically and resilient rubber support means between said each of said pair of horizontal abutment means and said horizontal abutment means whereby said body assembly and yoke are resiliently connected through said rubber support means and the said abutment.

4,061,197

METHOD AND APPARATUS FOR DRILLING IN PERMAFROST AND THE LIKE

Sam C. Skidmore, Jr., Box 470, Fairbanks, Alaska 99707

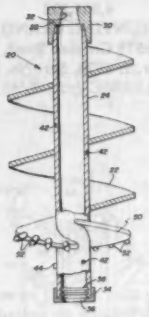
Filed Nov. 6, 1975, Ser. No. 629,387
Int. Cl.[2] E21B *1/06*
U.S. Cl. 175—101 **9 Claims**

1. An article of manufacture, comprising:

a. an earth auger consisting of a helical flight which is affixed to the exterior of a central tube, with the upper end of the auger having means by which torque may be applied for rotating the auger, and the bottom end of the tube being open to present an exposed bore, and the internal diameter of the tube being slightly greater than the outer diameter of a downhole percussion hammer to be accommodated therein, so that the tube may receive an auxiliary earth-

drilling mechanism in the form of a percussion hammer, and there being a thin annular space between the hammer and the central tube; and

b. structural means located internally of the tube at the top end thereof for engaging threads at the top end of a downhole percussion hammer, such that a percussion hammer may be threadably engaged as a self-contained unit with



respect to said central tube, and said structural means further having a central longitudinal bore for passing compressed air from an external source to a central opening in the end of the downhole percussion hammer, whereby the single act of providing relative rotation between the central tube and the percussion hammer will serve both to join the two elements structurally and to establish a flow path for compressed air to the hammer.

4,061,198

ELECTRONIC WEIGHING SYSTEMS

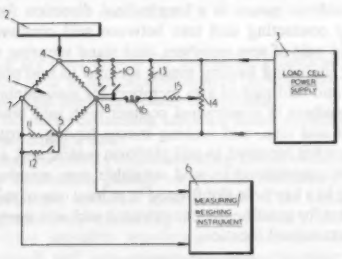
Jack Richard Caldicott, Stockport, England, assignor to Railweight Inc. (U.K.) Limited, England

Filed Oct. 8, 1976, Ser. No. 730,963

Claims priority, application United Kingdom, Oct. 10, 1975, 41703/75

Int. Cl.[2] G01G *19/52, 23/14, 3/14*

U.S. Cl. 177—50 **4 Claims**



1. A weighing system in which a weighing platform is operatively coupled to a transducer arrangement included in an electrical bridge circuit having connected therein a tare resistor arrangement for balancing out the tare weight of the platform, comprising means for selectively isolating the effect of the tare resistor arrangement from the bridge circuit so that the system output indicates the sum of the tare weight of the platform and the weight of any load on the platform.

4,061,199

CHASSIS FOR A VEHICLE CAPABLE OF TRAVELLING OVER OBSTRUCTIONS

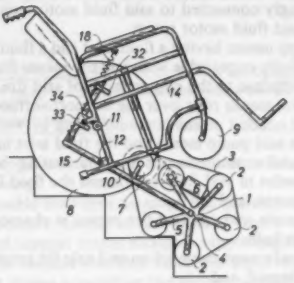
Werner Last, Hamburg, Germany, assignor to Karl-Heinz Werner Toosbuy, Bredebro, Denmark

Filed Nov. 26, 1975, Ser. No. 635,488

Claims priority, application Germany, Dec. 3, 1974, 2457013

Int. Cl.[2] B62D *57/02*

U.S. Cl. 180—8 A **15 Claims**



1. A mechanism for a vehicle having a frame capable of travelling over obstacles, comprising

a. a chassis;

b. roadwheels supporting the frame;

c. a spider rotatably connected to the chassis and having a plurality of step wheels rotatably mounted at the ends of its arms;

d. endless elastic belt means connecting the step wheels by engaagement with their peripheries;

e. the distance between successive step wheels being sufficient to permit the belt means to fold into engagement with the riser and tread of a stair step encountered by the vehicle; and

f. a drive means on said vehicle, including a drive wheel disposed outside the periphery of the spider, for directly engaging and driving the belt means.

4,061,200

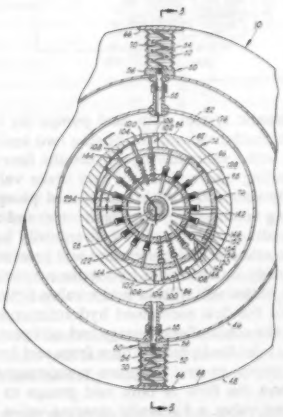
VEHICULAR ENERGY GENERATION SYSTEM

Joseph A. Thompson, 301 NE. 11th St., Oklahoma City, Okla. 73104

Filed Jan. 12, 1976, Ser. No. 648,390

Int. Cl.[2] B60K *25/08*

U.S. Cl. 180—66 B **8 Claims**



1. An energy generation system for use with a vehicle or the

like having an axle and supportable on a supporting surface, comprising:

resilient tire means mounted on said axle for supporting at least a portion of the weight of said vehicle on the support surface, said tire means being compressible in response to the weight of the vehicle supported thereby;

a fluid motor secured to said vehicle and having a fluid inlet and a fluid outlet and a fluid motor rotor journaled for rotation about the axis of rotation of said axle;

output shaft means journaled in said fluid motor and drivingly connected to said fluid motor rotor for rotation by said fluid motor rotor;

pump means having a fluid inlet and a fluid outlet and operatively engageable with said tire means for pumping fluid in response to the compression of said tire means when said tire means rolls over the support surface;

first conduit means communicating between the fluid outlet in said pump means and the fluid inlet in said fluid motor;

second conduit means communicating between the fluid outlet in said fluid motor and the fluid inlet in said pump means; and

wherein said resilient tire means is characterized further to include:

wheel means mounted on said axle for rotating about the axis thereof; and

a tubular, inflatable tire mounted on said wheel means; and

wherein said pump means is characterized further to include:

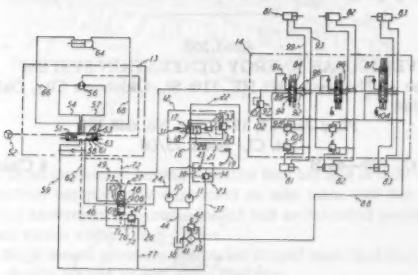
at least one radially compressible chamber mounted on said wheel means and disposed within said tubular tire and engageable therewith, and with the interior of said compressible chamber communicating with the fluid outlet and the fluid inlet of said pump means.

4,061,201

HYDRAULIC SYSTEM WITH DUAL PUMPS FOR TRACTOR BRAKE, STEERING, AND LOADER VALVES

Donnell Lynn Dunn, Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Aug. 26, 1976, Ser. No. 718,011
Int. Cl.[2] B62D *5/08*
U.S. Cl. 180—133 **7 Claims**



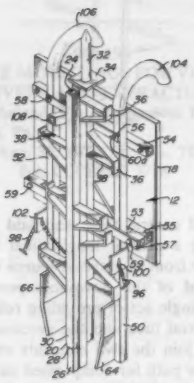
1. A hydraulic system with dual pumps for tractor brake, steering, and loader valves, comprising two hydraulic pumps, a hydraulic brake valve having a hydraulic flow-through passageway leading into and out of said brake valve and being hydraulically connected with one of said pumps, a pressure compensating valve having a hydraulic inlet and two hydraulic outlets, a hydraulic connection hydraulically interconnected between the other of said pumps and said pressure compensating valve inlet, an additional hydraulic connection interconnecting the outlet side of said brake valve flow-through passageway and the first mentioned hydraulic connection interconnecting the other of said pumps and said pressure compensating valve inlet for hydraulic flow from said brake valve and said other pump to said pressure compensating valve and thereby direct the flow of both said pumps to said pressure compensating valve, a hydraulic steering valve hydraulically connected with one of said outlets of said pressure compensating valve, a hydraulic pilot line hydraulically connected between said steering valve and said pressure compensating valve for hydraulically setting the latter in accordance with hydraulic pressure in said steering valve for directing hydraulic flow relative to said two outlets, and a loader valve hydraulically connected with the other of said outlets of said pressure compensating valve for receiving hydraulic flow from said pressure compensating valve.

4,061,202

HUNTING STAND

Donald E. Campbell, 9575 Gorman Road, Laurel, Md. 20810

Filed Apr. 1, 1976, Ser. No. 672,735
Int. Cl.[2] E06C *1/10, 1/36, 7/48*
U.S. Cl. 182—20 **2 Claims**



1. A hunting stand vertically displaced from a ground surface and adapted to be mounted to a tree comprising:

a. platform means having an extended planar surface;

b. sectional ladder means removeably constrained to said ground surface and said platform means on opposing ends thereof; and,

c. stand securing means moveably mounted to said platform means, said stand securing means including (1) a pair of arm members transversely moveable with respect to said platform means for frictionally gripping said tree on opposing sides thereof, (2) a grip bar member having a substantially smooth concave seat adapted in contour to frictionally interface with an arcuate surface contour of said tree and being linearly displaceable with respect to said platform means in a longitudinal direction for frictionally contacting said tree between said concave seat and said pair of arm members, said stand securing means further including locking means secured to said platform means and said pair of arm members for maintaining said arm members in constrained contact with said boundary wall of said tree, said locking means having a rotatable arm member mounted to said platform means; and, a chain element constrained to said rotatable arm member and passing to a key hole slot formed in at least one of said arm members for positionally constraining said arm member in a predetermined location.

4,061,203

LADDER ATTACHMENT

Frederick J. Spencer, Hinsdale, and Edward Spencer, LaGrange, both of Ill., assignors to Spencer Tool & Mfg. Co. Inc., Chicago, Ill.

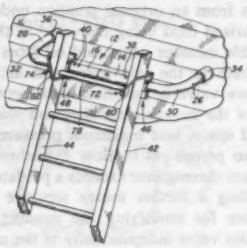
Filed Feb. 28, 1977, Ser. No. 772,932
Int. Cl.[2] E06C *7/48*
U.S. Cl. 182—214 **3 Claims**

1. A knockdown antisway or stabilizer device for the upper

end of an extension ladder having a pair of side rails and rungs comprising, in combination:

a. a pair of horizontal elongated tubular members removably secured together end to end, the free end of said members being bent at right angles to said horizontal portion of said members and both bent in the same direction to form legs;

b. a pair of U-shaped angle brackets each having a pair of spaced side walls and a connector top wall, and outwardly



extending flanges on the free ends of said side walls, each of said flanges having an arcuate slot formed therein and arranged cater-cornered from each other, each side wall having opposed apertures therein;

c. means for removably securing said brackets one to each of said members in spaced relation; and

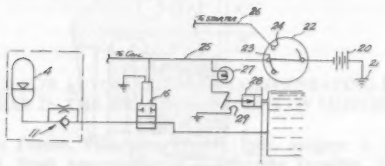
d. a pair of U-shaped bolts having legs for anchoring said brackets and members to the rails of said ladder and about the uppermost rung thereof.

4,061,204

ENGINE PRE-OILER

Walter C. Kautz, Jr., 21707 NW. 51st Ave., Ridgefield, Wash. 98646

Filed Feb. 9, 1976, Ser. No. 656,140
Int. Cl.[2] F01M *9/00*
U.S. Cl. 184—6.3 **2 Claims**



1. A pre-oiler system for pressurizing lubricant within machinery prior to normal operation of the machinery lubrication system, said pre-oiler system comprising,

an oil vessel containing lubricant under pressure, said vessel including a base,

means selectively communicating the oil vessel interior with a lubrication passageway of the machinery, said means remotely actuated upon closure of an electrical circuit preparatory to starting of the machinery, and

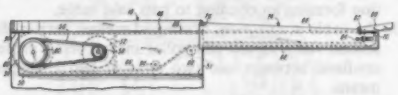
a valve assembly regulating lubricant flow between said vessel and said selectively communicating means and including a spring biased movable valve body having a first position whereat a restricted return flow of lubricant may enter said vessel during normal operation of the machinery lubrication system to gradually charge said vessel while adequate machinery lubrication system pressure is maintained, said valve body having a second position permitting an oppositely directed outward flow of lubricant from said vessel for machinery lubrication at a greater rate than the first position flow rate of said valve body, said movable valve body having multiple ports therein some of which are closed in said first position while other of said ports at all times remaining open.

4,061,205

CHECKOUT ASSEMBLY HAVING DUAL BAGGING STATION

Malcolm E. Musser, P.O. Box 386, Jackson Center, Ohio 45334

Filed Nov. 12, 1976, Ser. No. 741,380
Int. Cl.[2] A47F *10/00*; B65G *15/12, 21/14*
U.S. Cl. 186—1 A **7 Claims**



1. Conveyor apparatus adapted for use with a checkout assembly, comprising:

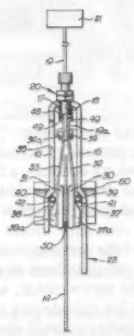
an endless rotatable conveyor member, the endless rotatable conveyor member having a first portion and a second portion, fixed support means rotatably supporting the first portion of the endless rotatable conveyor member, movable support means supporting the second portion of the endless rotatable conveyor member, the movable support means being movable to an active position in which the second portion of the endless rotatable conveyor member is in substantially the same plane as the first portion thereof, the movable support means being movable to an inactive position in which the second portion of the endless rotatable conveyor member is at an angle with respect to the first portion thereof.

4,061,206

BICYCLE BRAKE

William H. Wood, Reseda, Calif., assignor to Airheart Products, Inc., Chatsworth, Calif.

Filed Dec. 27, 1976, Ser. No. 754,426
Int. Cl.[2] B62L *3/02*
U.S. Cl. 188—26 **11 Claims**



1. In a brake for a motorcycle or bicycle having a frame and a disc rotatable with a wheel, the combination comprising

a. a housing having a fork defining a slot to receive a wheel axle bolt, and a connection to the frame, the housing configured to embrace a portion of the disc,

b. brake pad means located within the housing to laterally engage the disc,

c. a carrier and first ramp means on the carrier and supporting the brake pad means, the carrier being longitudinally movable and laterally resiliently flexible, within the housing,

d. second ramp means on the housing and presented generally toward the first ramp means, and

e. roller means located between the first and second ramp

means to rollably urge the first ramp means and brake pad means laterally toward the disc, with accompanying resilient flexing of the carrier, in response to bodily movement of the carrier and first ramp means in one longitudinal direction,

f. there being a cable having a connection with the carrier and extending from the housing to be pulled for bodily moving the carrier and first ramp means in said longitudinal direction,

g. said housing comprising a U-shaped strap means having two arms and a cross-over connection, said arms extending in said longitudinal direction, said cross-over connection forming an opening to pass said cable,

h. the cable connection, brake pad means, carrier, first and second ramp means and roller means being protectively confined between said two arms of said U-shaped strap means.

4,061,207

MODULATING ARRANGEMENT FOR SERVO-MOTOR ACTUATED DISC BRAKE

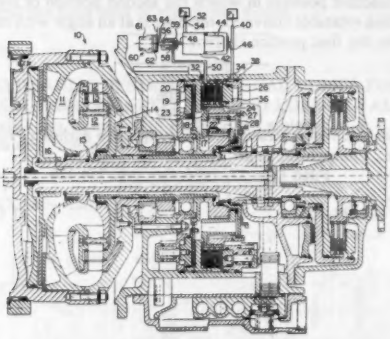
Karl Gustav Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Stockholm-Vallingby, Sweden

Continuation of Ser. No. 366,168, June 1, 1973, abandoned. This application Sept. 29, 1975, Ser. No. 617,643

Claims priority, application United Kingdom, Mar. 21, 1973, 13599/73

Int. Cl.² F16D *65/853*

U.S. Cl. 188—264 E **3 Claims**



1. A friction brake comprising:

means defining a generally enclosed space containing engaging friction braking surfaces, a fluid operated servo-motor for urging the friction braking surfaces together, said servo-motor defining in part said generally enclosed space, and a retarding means for counterbalancing the urging force of the servo-motor to thus retard the engagement of the braking sufaces as a pressurized fluid is being supplied to the servo-motor, said retarding means comprising means for introducing oil under pressure directly into said generally enclosed space such that said oil under pressure also passes between the friction braking surfaces, the pressure of the oil in said generally enclosed space being sufficiently great to at least partially retard the urging force of the servo-motor tending to bring about engagement of the braking surfaces, said retarding means being operable to introduce said pressurized oil in response to the delivery of said pressurized fluid to the servo-motor to engage the friction braking surfaces and concurrent with the introduction of said fluid to the servo-motor, said retarding means further including limiting means for limiting the time during which the said oil is introduced to said generally enclosed space to only an initial part of the time during which brake engagement is being brought about, and for thereafter permitting reduction of the pressure in the said generally enclosed space to permit the servo-motor to complete the bringing about of brake engagement,

said limiting means including a cylinder, a movable member within the cylinder, one side of the movable member being in a fluid communication with the pressurized fluid entering the servo-motor, and the other side of the movable member containing said oil and being selectively in fluid communication along a fluid path with the said generally enclosed space, whereby as the movable member moves from an original position under the force of the pressurized fluid being delivered to the servo-motor, the movable member urges said oil from the cylinder along said path to the said space and including a maximum pressure valve in said fluid path between the said other side of the movable member and the said generally enclosed space, said maximum pressure valve being openable to permit oil to flow therethrough only after the pressure thereagainst exceeds a predeterminable level, and including a further means separate from the movable member for modifying the opening of said maximum pressure valve independently of the movable member.

4,061,208

PAD-WEAR COMPENSATING DEVICE FOR DISC BRAKE

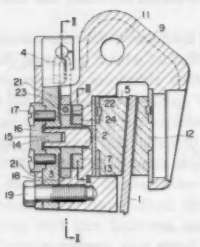
Yukinori Nishiyama, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 8, 1976, Ser. No. 748,443

Claims priority, application Japan, Dec. 17, 1975, 50-150928

Int. Cl.² F16D *65/56*

U.S. Cl. 188—71.9 **7 Claims**



1. In a disc brake assembly including a yoke member (9) arranged to straddle a brake disc (1), a brake pad (5) slidably mounted in the yoke member, an axially movable push rod (2) for urging the pad against the brake disc, a cam nut (3) threadingly engaging the push rod, and rotatable lever means (4, 21) engagable with the cam nut via a one-way clutch mechanism (20, 22, 23) for rotating the cam nut to thereby advance the push rod in the direction of the brake pad, a pad-wear compensating mechanism characterized by:

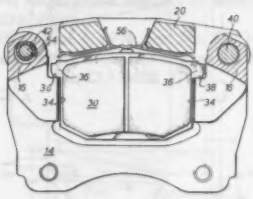
a cam member engaged with said cam nut to rotate therewith in the direction which moves said push rod towards said pad only after said cam member rotates through a preset angle, unidirectional means for preventing rotation of said cam member in the opposite direction, and the engagement between said cam member and said cam nut stopping the opposite direction rotation of said cam nut after rotation through said preset angle in said opposite direction.

4,061,209

DISC BRAKE CALIPER AND SUPPORT STRUCTURE

David William Gee, Lea Marston, near Sutton Coldfield, England; Horst Willi Klassen, St. Sebastian, and Heinrich Bernard Rath, Koblenz-Luetzel, both of Germany, assignors to Girling Limited, Birmingham, England

Continuation of Ser. No. 563,492, March 31, 1975, abandoned.
This application Sept. 20, 1976, Ser. No. 724,534
Claims priority, application United Kingdom, Mar. 12, 1974, 14469/74
Int. Cl.² F16D 65/02
U.S. Cl. 188—73.3 39 Claims



1. A vehicle disc brake comprising a carrier member for fixing to a vehicle, a caliper member slidably connected to the carrier member and an actuator for urging a first friction pad onto one side of a rotatable disc to cause the caliper member to slide relative to the carrier member and apply a second friction pad to the other side of the disc, the sliding connection between the caliper member and carrier member comprising a pair of pins slidable in one of the members and secured to the other of the members, at least one of the pins being received in an oversized opening in said one of said members, and a resilient bush interposed between said oversized opening and said at least one pin so as to surround that pin, the fit of said at least one pin and the bush within the oversized opening being such that said at least one pin can at all times effect radial displacement relative to its associated opening without deformation of the resilient bush, and means resiliently biassing said at least one pin into an eccentric position within the oversized opening.

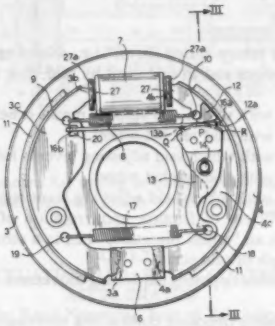
4,061,210

DEVICE FOR AUTOMATICALLY COMPENSATING FOR WEAR IN THE BRAKING SYSTEMS OF MOTOR VEHICLES

Osvaldo Fasano, Villarbasse (Turin), Italy, assignor to Start S.p.A. Studi Apparecchiature e Richerche Tecniche, Turin, Italy

Filed Nov. 30, 1976, Ser. No. 746,028
Claims priority, application Italy, Dec. 1, 1975, 69952/75
Int. Cl.² F16D 65/54
U.S. Cl. 188—79.5 P 4 Claims

1. In a drum brake of the type having a pair of arcuate brake shoes pivotally mounted on a stationary backing plate for movement into and out of engagement with a rotatable brake drum surrounding said brake shoes with each brake shoe including a rim portion provided with a friction lining and a flat web portion, actuating means disposed between opposed ends of said brake shoes for moving said brake shoes into frictional engagement with said drum and spring means for retracting said brake shoes away from said drum, the improvement comprising automatic wear compensating shoe adjusting means including a projection carried by the web of one of the two shoes and having a curved surface lying in a plane parallel to said web, a locking lever pivotally connected to said web for pivotal movement in the plane of the curved surface of said projection and having a cam surface on the end of said lever facing said curved surface of said projection, an elongated rod extending between said two shoes and having one end inserted between said curved surface of said projection and said cam surface of said locking lever and the other end of said rod being connected to the web of the other shoe through a lost motion coupling allowing limited relative movement between said rod and said other shoe in the direction of the length of said rod and resilient means having one end thereof operatively connected to said other shoe with the opposite end of said resilient



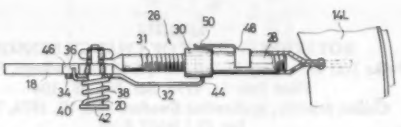
means being connected to said locking lever adjacent the end opposite said cam surface whereby said resilient means will also exert a retracting force on said brake shoes in addition to rotating said locking lever in a direction such that said one end of said rod is locked between said curved surface of said projection and said cam surface.

4,061,211

INTERNAL SHOE DRUM BRAKE

Kazuo Hoshino, Sayama, and Masakazu Tanbara, Higashi-Kurume, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Feb. 25, 1977, Ser. No. 772,092
Claims priority, application Japan, Jan. 3, 1976, 51-21072
Int. Cl.² F16D 65/56
U.S. Cl. 188—79.5 P 3 Claims



1. An internal shoe drum brake comprising:
a pair of shoes;
service brake means for expanding said brake shoes;
shoe return spring means for retracting said shoes toward each other;
an extensible strut extending between said shoes and including a ratchet wheel which may be rotated to extend said strut, an adjusting lever with a pawl tooth engageable with said ratchet wheel to rotate the same, stopper means held in yielding contact with said ratchet wheel, and an actuating lever with a finger engaging in one of said shoes;
a shaft on which said actuating lever and said adjusting lever are mounted for rotation about the axis of said shaft, said shaft being coupled to said actuating lever for rotation therewith, the adjusting lever being rotatable relative to said shaft and said actuating lever, and
a torsion spring prestressed to transmit forces from said shaft and said actuating lever to said adjusting lever to actuate the same, said torsion spring being also prestressed to hold said pawl in yielding contact with said ratchet wheel;
in which said brake is so designed as to satisfy that:

$$X < \frac{1}{k_1}(Z + F) - k_2$$

$$X > \frac{k_5}{k_4}P - \frac{1}{k_4}Z + k_3$$

$$X > k_5k_6P + k_3$$

where

X: a "shoe return spring force," i.e., a load applied to said pair of shoes and to said strut by said shoe return spring means,

Z: a force with which said stopper means is held in yielding contact with said ratchet wheel,

P: a force with which said adjusting lever is held in yielding contact with said ratchet wheel,

F: a force with which said adjusting lever is actuated,

k_1: a coefficient of friction upon rotation of said ratchet wheel in an "adjust direction," i.e., in a sense to increase the length of said strut,

k_2: a resistance opposing expanding movement of said pair of shoes,

k_3: a resistance opposing contracting movement of said pair of shoes,

k_4: a coefficient of friction upon rotation of said ratchet wheel in a direction opposite to the "adjust direction",

k_5: a coefficient representing the effect of the force P on a resistance opposing rotation of said ratchet wheel in the opposite direction to the "adjust direction",

k_6: a ratio of a distance between said pawl tooth of said adjusting lever and the axis of said shaft to a distance between said finger of said actuating lever and the axis of said shaft.

4,061,212

ROTATIONAL RATE OF CHANGE SENSOR

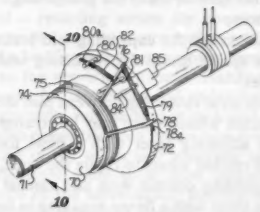
Folke Ivar Blomberg, Duvstigen 4, S-181 40 Lidingo, Sweden

Filed Feb. 11, 1976, Ser. No. 657,104

Claims priority, application Sweden, Feb. 19, 1974, 7401882

Int. Cl.[2] B60T *8/04*

U.S. Cl. 188—181 A **78 Claims**



40. In a sensor for responding to the rate of change of changing rotational speeds of a vehicle wheel and including a flyweight coupleable for rotation in response to wheel rotation and selectively decoupleable in response to the exertion on the flyweight of a torque having a magnitude greater than a threshold magnitude due to a change in rotational speed of the wheel, the improvement comprising means for exerting on the flyweight a substantially constant torque resisting decoupled rotation of the flyweight.

4,061,213

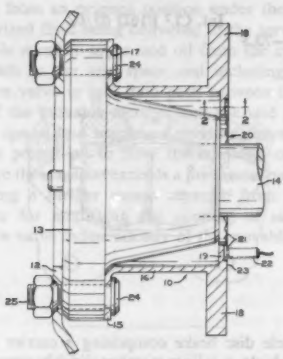
BRAKE DISC ADAPTER FOR USE WITH ANTI-SKID SYSTEM

David Larry Davy, Troy, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 577,902, May 15, 1975. This application Oct. 22, 1976, Ser. No. 734,944

Int. Cl.[2] B60T *8/08*

U.S. Cl. 188—181 R **3 Claims**



1. In a wheel and disc brake assembly having at least one substantially radially extending rotatable brake disc and a disc adapter connected to and extending axially outwardly from the rotatable brake disc to a rotatable portion of the wheel, the improvement wherein the disc adapter further comprises a substantially radially extending annular flange having a substantially flat radially extending annular surface facing axially inwardly of the wheel, the surface comprising an exciter ring portion having a plurality of equally and annularly spaced, radially extending surface variations, said exciter ring portion being adapted to be operatively situated adjacent to a magnetic pickup device spaced axially inwardly from the surface, said pickup device being a component of a skid control system.

4,061,214

HYDRODYNAMIC BRAKE DEVICE FOR MOTOR VEHICLES

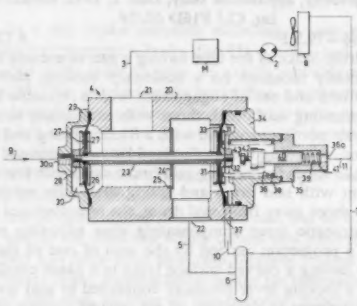
Runo Roy Oskar Ternehäll, Skarhamn, Sweden, assignor to AB Volvo, Goteborg, Sweden

Filed Sept. 16, 1976, Ser. No. 724,065

Claims priority, application Sweden, Sept. 24, 1975, 7510702

Int. Cl.[2] F16D *65/813*

U.S. Cl. 188—277 **9 Claims**



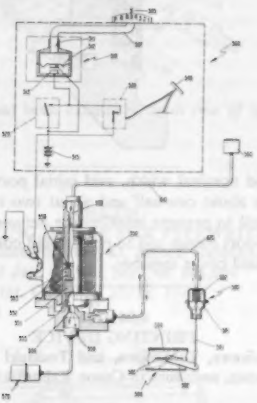
1. Hydrodynamic brake device for motor vehicles, comprising a rotor, rotatably journalled in a stator shell, which rotor is operably connected to the transmission of the vehicle, said

stator shell having a fluid inlet and outlet, a regulator valve for regulating the supply of brake fluid to the fluid inlet of the stator shell and a thermostat that controls said regulator valve for regulating the degree of filling of the stator shell depending on the temperature of the brake fluid, said thermostat controlling said regulator valve so as to decrease the degree of filling as the temperature of the fluid increases.

4,061,215
ENGINE EXHAUST BRAKE CONTROLLED BY TRANSMISSION AND ACCELERATOR

Kazuo Ishikawa, Aichi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed June 4, 1976, Ser. No. 692,746
Claims priority, application Japan, June 11, 1975, 50-71091
Int. Cl.² B60K *21/00*
U.S. Cl. 192—4 A **3 Claims**



1. An improved internal combustion engine exhaust brake control device for use in conjunction with an automatic transmission, of the type in which a manually actuated switch in series with a throttle switch electrically activates an exhaust brake, the improvement comprising switch means electrically connected in parallel with the manual switch and in series with the throttle switch for automatically energizing the exhaust brake on manually down-shifting the automatic transmission and on release of the throttle setting.

4,061,216
GEARBOX DECOUPLER

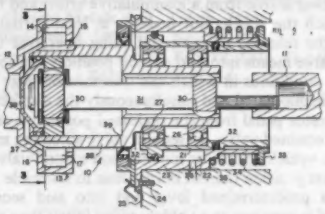
Richard N. Sullivan, Tempe, and John E. Vance, Scottsdale, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Continuation of Ser. No. 522,080, Nov. 8, 1974, abandoned. This application Oct. 6, 1976, Ser. No. 729,922
Int. Cl.² F16D *11/12, 41/00, 43/28*
U.S. Cl. 192—46 **10 Claims**

1. Apparatus for coupling and decoupling driving and driven elements, comprising:

a. pawl and ratchet type clutch means having complemental parts on said driving and driven elements, at least one of said parts being provided with members movable in a plane substantially radial to the axes of said elements to engage the other part and effect a driving relation between said elements, one part of said clutch means being movable axially relative to one of said elements;

b. means for moving said one part axially of said one element to interrupt and reestablish radial registration of said members with said other part of said clutch means; and

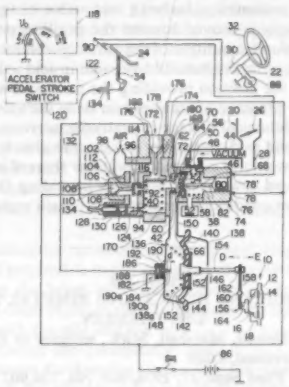


c. resilient means for urging in one direction said means for moving said one part axially of said one element.

4,061,217
CLUTCH ACTUATING APPARATUS CONTROLLED BY ACCELERATOR

Hiroshi Toyota; Kenji Nagatome, both of Yokosuka, and Tamio Kawamoto, Sagamihara, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 4, 1976, Ser. No. 664,004
Int. Cl.² F16D *67/00*; B60K *21/00*
U.S. Cl. 192—.052 **5 Claims**



1. In an automotive vehicle including a vacuum source, a transmission gear shift lever and an accelerator pedal, an apparatus for actuating an automatically operated clutch forming part of the driveline of the vehicle and continuously operable between a disengaged condition and a fully engaged condition through a partial torque transmission range, comprising (a) a vacuum chamber in communication with said vacuum source, (b) an air chamber communicable with the open air through each of first and second restricted-flow air inlet ports, (c) a valve chamber alternately communicable with said vacuum chamber and said air chamber, (d) first valve means having a first position isolating said vacuum chamber from said valve chamber and establishing communication between said air chamber and said valve chamber and a second position blocking the communication between the air and valve chambers and establishing communication between the vacuum and valve chambers, (e) second valve means having a first position allowing said first air inlet port to open and a second position closing the first air inlet port, (f) third valve means continuously movable between a first position closing said second air inlet port and a second position allowing the second air inlet port to fully open, (g) first valve actuating means for moving said first valve means in response to predetermined conditions

of the transmission gear shift lever and the accelerator pedal, said first valve actuating means being operative to move said first valve means into said first position thereof in response to at least one of the condition in which the transmission gear shift lever is free from a manipulative effort and the condition in which the accelerator pedal is at least partially depressed from the released position and being operative to move said first valve means into said second position thereof in response to the conditions in which the transmission gear shift lever is being manipulated and simultaneously the displacement of the accelerator pedal from the realeased position is smaller than a predetermined value, (h) second valve actuating means responsive to vehicle speed for moving said second valve means into said first position thereof in response to a vehicle speed higher than a predetermined level and into said second position thereof in response to a vehicle speed lower than said predetermined level, (i) third valve actuating means responsive to movement of the accelerator pedal for continuously moving said third valve means between said first and second positions thereof as the accelerator pedal is moved between the released position and the fully depressed position so that the flow of air through said second air inlet port is varied substantially proportionate to the depth to which the accelerator pedal is depressed from the released position thereof, (j) a differential-pressure assembly including a variable-volume chamber defined in part by a flexible diaphragm which is at least partially movable between positions respectively providing minimum and maximum volume conditions of said variable-volume chamber, and biasing means for urging said diaphragm toward the position providing the maximum volume condition in said variable-volume chamber, said variable-volume chamber being in constant communication with said valve chamber so that said diaphragm is moved toward the position providing the minimum volume condition of the variable-volume chamber in the presence of intake manifold vacuum in said valve chamber and toward the position providing the maximum volume condition of the presence of atmospheric air in the valve chamber, and (k) a mechanical linkage operatively interconnecting said diaphragm and said clutch for driving the clutch toward the disengaged and fully engaged conditions thereof as the diaghragm is moved toward the positions providing the minimum and maximum conditions, respectively, of said variable-volume chamber.

4,061,218

FLUID COUPLING DEVICE AND BIMETAL COIL FOR USE THEREIN

Thomas H. Tinholt, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sept. 27, 1976, Ser. No. 726,907

Int. Cl.[2] F16D *35/00, 43/25*

U.S. Cl. 192—58 B **12 Claims**

1. A fluid coupling device comprising:

a. a first rotatable member;

b. cover means associated with said first member to define a fluid chamber therebetween;

c. valve means disposed to separate said fluid chamber into a fluid operating chamber and a fluid reservoir chamber;

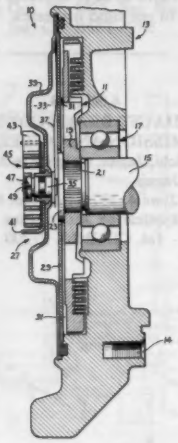
d. a second rotatable member disposed in said fluid operating chamber and being rotatable relative to said first member;

e. said valve means including a movable valve member operable to control the flow of fluid between said operating chamber and said reservoir chamber, and further including a valve shaft having an inner end disposed within said fluid chamber and an outer end extending through said cover means, said movable valve member being operable associated with said inner end;

f. said cover means including a cover member and means supporting said valve shaft for rotation relative to said cover member, said support means extending outwardly beyond said cover member;

g. a bimetal coil operable to control the position of said valve shaft, said bimetal coil having a first end portion operatively associated with said outer end of said valve shaft and a second end portion fixedly mounted relative to said cover means; and

h. said bimetal coil defining a nominal width over a major portion of its length and including an initial portion adjacent said first end portion having a width substantially less



than said nominal width, said initial portion comprising between about one-half and about two turns of said bimetal coil to prevent interference between said coil and said support means and to permit said coil to be disposed nearer said cover member.

4,061,219

PRINTING DEVICE

Tatsuo Nishikawa, Tachikawa, and Toshiaki Ozawa, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 333,551, Feb. 20, 1973, abandoned.

This application June 24, 1975, Ser. No. 589,905

Claims priority, application Japan, Feb. 24, 1972, 47-19114; Mar. 2, 1972, 47-21668; Mar. 3, 1972, 47-22099; Mar. 8, 1972, 47-23858; Feb. 24, 1972, 47-22771[U]; Feb. 24, 1972, 47-22772[U]; Feb. 24, 1972, 47-22773[U]; Mar. 2, 1972, 47-26033[U]

Int. Cl.[2] B41J *33/22*

U.S. Cl. 197—164 **6 Claims**

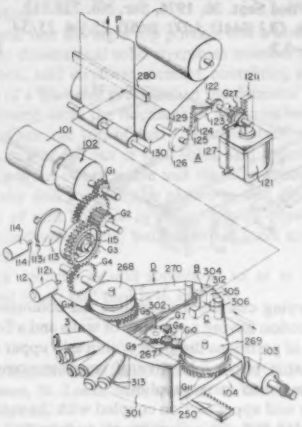
1. A printing device comprising

a pair of spools mounted on a carriage for supplying and winding up a ribbon for printing, said spools each having a shaft;

a motor; and

means mounted on said carriage for transmitting the rotational force of said motor to one of said spools, said transmitting means including, a first gear driven by means adjacent said carriage engaging said first gear, a plurality of gears rotatably in mesh with said first gear, a turret head disposed coaxially with said first gear for rotatable movement and having thereon said plurality of gears, an index gear coaxially and integrally provided with said turret head, a ball fitted in a valley portion of said index gear, a spring for pressing said ball, a screw for fixing and adjusting the urging force of said spring, intermediate gears mounted on said carriage for selective engagement with one of said plurality of gears, and spool gears provided on the shafts of said pair of spools, respectively, to be in mesh with said intermediate gears, and wherein said intermediate gears transmit the motor rotational force to one of said spool gears upon being selectively rotated by one of said plurality of gears and said plurality of gears,

turret head, index gear, ball, spring and screw are employed to automatically switch the ribbon feeding when



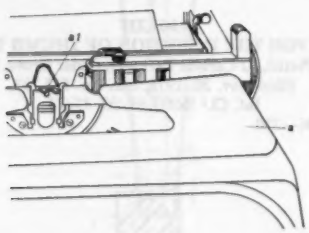
the ribbon has been exhausted from one of said pair of spools.

4,061,220

CORRECTING DEVICE FOR TYPEWRITERS

Chi-Liang Cho, Feldblumenweg 47, Zurich, Switzerland (8048)

Filed Jan. 5, 1976, Ser. No. 584,594
Int. Cl.² B41J *35/22, 35/28*
U.S. Cl. 197—181 **12 Claims**



1. A correction device for use in combination with a type bar typewriter including a platen, type keys, type bars, an ink ribbon maintained in a normal rest position between the platen and said type bars and means including a universal bar and an ink ribbon lever for lifting said ink ribbon from its normal rest position to its normal typing position, when a type key is depressed, said correcting device comprising:

a. a cassette containing rotatable feed and take-up spools for receiving a roll type correcting strip, mounting means for fixedly mounting said device on said typewriter and means for removably mounting said cassette on said mounting means, said cassette being mounted on said mounting means with the correcting strip generally above the normal rest position of the ink ribbon and for lateral sliding movement in a direction parallel with the platen of the typewriter between operative and inoperative correcting positions, and correcting strip in said operative position disposed above said ink ribbon rest position and in the normal typing position of said ink ribbon; and

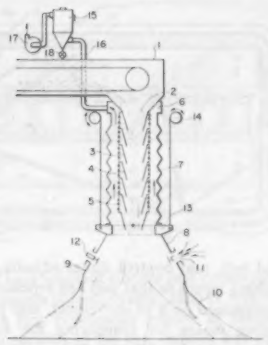
b. means for preventing lifting of said ink ribbon to its typing position when a type key is depressed and said correction device is in said operative position.

4,061,221

DUST CONTROLLING LOADING CHUTE APPARATUS FOR PARTICULATE MATERIAL

Koichi Higashinaka, and Tetsuo Kai, both of Kumagaya, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Feb. 8, 1977, Ser. No. 766,822
Claims priority, application Japan, Feb. 13, 1976, 51-14019
Int. Cl.² B65G *65/32, 11/14*
U.S. Cl. 198—524 **10 Claims**



1. An apparatus for loading particulate materials, comprising:

a. a discharge chute assembly including a flexible, longitudinally expandable and contractable outer pipe concentrically surrounding a flexible, longitudinally expandable and contractable inner pipe to define an annular space therebetween,

b. a flared, skirted hood sealingly attached to the lower end of the chute assembly,

c. a plurality of air inlet ports disposed in the hood,

d. an equal plurality of switch means individually disposed adjacent the inlet ports for detecting the surface of a pile of particulate material being discharged through the inner pipe,

e. winch means for controlling the vertical height of the hood and responsive to the actuation of the switch means for raising the hood, and simultaneously contracting the inner and outer pipes, to thereby maintain the hood skirt in contact with the pile surface,

f. a dust collector and precipitator, and

g. exhaust means for drawing air through the inlet ports and up through the annular space into the collector and precipitator, whereby dust generated by the discharged material is contained within the hood, mixed with the air flow, and delivered to the collector and precipitator.

4,061,222

WEB TRACKING APPARATUS

Allen J. Rushing, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 594,396, July 9, 1975, abandoned. This application June 17, 1976, Ser. No. 696,960
Int. Cl.² B65G *15/64*
U.S. Cl. 198—807 **9 Claims**

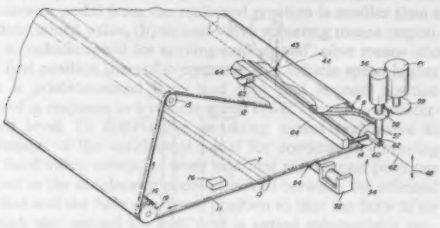
1. A control apparatus for tracking an endless belt of material in a predetermined path of movement comprising:

a. a belt steering roller for supporting said belt, said roller being adapted for rotational movement about a first central axis and tilting movement about a second axis extending through the midpoint of said roller and perpendicular to said first axis;

b. means connected to said roller for tilting said roller about said second axis in each of two opposite directions;

c. means for sensing the lateral position of said belt and for producing a first electrical signal representative thereof;

d. means for producing a second electrical signal representative of a desired lateral belt position;
e. means for sensing the tilt position of said roller and for producing a third electrical signal representative thereof; and
f. means for processing said first, second and third signals and for applying to said tilting means a steering roller control signal which compensates for changes in the shape



of said belt, said control signal adjusting the position of said tilting means so that said belt repeatedly tracks in said predetermined path of movement, said processing means including means for comparing the magnitude of the weighted sum of said first and third signals with the magnitude of the integrated sum of said first and second signals to produce said control signal, said control signal being proportional to the difference in magnitude between such compared signals.

4,061,223

STRETCHABLE BELT CONVEYOR

Hebert E. McGinnis, Akron, Ohio, assignor to The First National Bank of Akron, Trustee, Akron, Ohio

Filed Sept. 30, 1975, Ser. No. 618,259
Int. Cl.[2] B65G *41/00*
U.S. Cl. 198—821 20 Claims

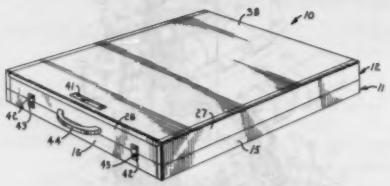
1. In combination, a stretchable endless flexible belt of elastic material having a generally Ushaped cross section with a base portion and side portions, said side portions having longitudinally extending edges, at least two spaced layers of reinforcing members having a high modulus of elasticity molded in said belt of elastic material and extending transversely of said belt between said edges, said reinforcing members being positioned at spaced-apart locations longitudinally of said belt and having a generally U-shape to conform with the shape of said belt, two layers of biased cords of textile material being disposed between said layers of reinforcing members, said cords of one of said layers of biased cords being laid at an opposite bias angle to said cords of the other of said layers of biased cords, and said elastic material being stretchable in the longitudinal direction at installation at least 5 percent and thereafter being stretchable and contractible in the longitudinal direction to permit elongation of said base portion and said side portions of said belt in amounts sufficient to maintain the cross-sectional shape of the belt when the belt is in a horizontal curve.

4,061,224

CARRYING CASE FOR ART SUPPLIES

William F. Fuhri, R.R. 5, Box 84, Liberty, Mo. 64068

Filed Sept. 30, 1976, Ser. No. 728,112
Int. Cl.[2] B44D *3/00*; B65D *25/04, 25/54*
U.S. Cl. 206—1.7 10 Claims



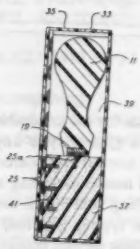
1. In a carrying case for art supplies, the combination of:
an upper section having a plurality of walls and a floor panel;
a plurality of partitions disposed within said upper section to divide same into a plurality of separate compartments each adapted to carry supplies;
a cover for said upper section coupled with the walls thereof for opening and closing movement to open and close said compartments from the top thereof;
a lower section bounded by walls and presenting a substantially hollow interior between said walls for carrying supplies; and
means pivotally coupling said upper section to said lower section for movement between a closed position wherein the floor panel of said upper section extends over said lower section in extension between the walls thereof to substantially cover the interior of said lower section, and an open position wherein the interior of said lower section is open at the top.

4,061,225

TOOL FOR THE INSERTION OF THUMB TACKS

George F. Pettitt, 32 Carlson Parkway, Cedar Grove, N.J. 07009

Filed Nov. 20, 1975, Ser. No. 633,793
Int. Cl.[2] B65D *69/00, 85/24*
U.S. Cl. 206—230 2 Claims



1. A thumb tack insertion means comprising:
a. a tool for inserting a thumb tack including:
1. a base which is rotationally symmetric and has an enlarged rounded portion at one end and a truncated conical section at the other end with a necked-down portion therebetween to form a flared portion of a size permitting the application of thumb and finger pressure, the rounded portion being of a size and spaced therefrom so as to permit palm pressure to also be applied, said truncated conical portion containing a recess of a diameter slightly greater than the size of the head of a thumb tack; and
2. a thin cylindrical magnet havint its top disposed a small distance below the end of said base secured into said

recess whereby a recess capable of retaining the head of the thumb tack will be provided; and

b. means for holding said tool and a supply of thumb tacks including:

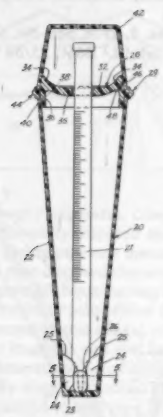
1. a plastic box having a top portion and a bottom portion;
2. a three dimensional solid styroform member sized to fit in said box, said stryform member containing a plurality of holes of a diameter greater than the diameter of the shank of a thumb tack, the thickness of said member being such that, when the top of said box is in place, tacks in said holes cannot fall out of said holes, said member also containing a cut-out of a size and shape to receive said tool, whereby said tool may be placed in said cut-out and the cover of said box put in place thereby providing a self-contained unit having both insertion tools and a plurality of tacks; and
3. a tack secured in said styroform so as to contact said magent when said tool is in said box.

4,061,226

THERMOMETER CASE AND HOLDER

R. Eric Essen, St. Louis, Mo., assignor to Intec Industries Inc., St. Louis, Mo.

Filed June 24, 1976, Ser. No. 699,531
Int. Cl.² B65D *85/38, 81/24*
U.S. Cl. 206—306 **15 Claims**



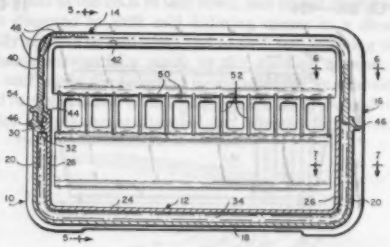
1. A thermometer case assembly comprising an elongated container portion for containing the major lower portion of a thermometer, a spacer lid hinged along one of its edges to an upper edge of said container portion and sized for pivotal movement of the lid about the container edge between an open and a closed position over the container portion, said spacer lid having an aperture therethrough, and a cap having an opening through which the top of the thermometer projects into the cap with the cap closed, said opening being substantially greater in one cross-sectional dimension than another, said cap being hinged along one of its narrower side edges and sized with its greater cross-sectional dimension permitting pivotal movement between an open and a closed position overlying said spacer lid and the top of said container portion when the spacer lid is in the closed position and a thermometer is in the case with its upper end projecting above the top of the lid sufficient for grasping for ready removal from the case, the top of the container portion and the spacer also being substantially greater in one cross-sectional dimension than another, said narrow cross-sectional dimensions of the top of the container, spacer lid, and cap being substantially closer to the cross-sectional dimension of the thermometer than the other of said cross-sectional dimensions.

4,061,227

SHOCK AND HEAT RESISTANT STORAGE UNIT

Anthony Olbres, Hampton, N.H., assignor to The Morley Company, Portsmouth, N.H.

Continuation of Ser. No. 571,420, April 24, 1975, abandoned. This application Sept. 13, 1976, Ser. No. 722,477
Int. Cl.² B65D *81/16, 85/30*
U.S. Cl. 206—454 **1 Claim**



1. A shock and heat-resistant storage unit comprising spaced parallel side wall panels of foam plastic, each of which contains at its inner side a first continuous groove of predetermined depth which runs parallel to the top, bottom and ends of the side walls and outer and inner second and third continuous grooves of predetermined greater depth than the first groove which runs parallel to the bottom and up the ends of the side wall panels at opposite sides of the first groove to a level substantially midway between the top and the bottom, the outer grooves containing at their upper ends laterals, an outer U-shaped bottom wall molding comprising a bottom panel and integral end panels, the opposite edges of said bottom panel and end panels being engaged within said outer grooves and said end panels having at their upper ends outwardly projecting, transversely extending shoulders interengaged with the laterals at the upper ends of the outer grooves, one of the end panels having at its inner side below the top an inwardly projecting, transversely extending shoulder, said side wall panels and U-shaped bottom wall molding collectively constituting an outer supporting structure which is resistant to heat transfer and shock; an inner U-shaped bottom molding comprising a bottom panel and integral end panels, the opposite edges of said bottom panel and integral end panels being engaged within the inner grooves and one of the panels of the inner U-shaped bottom wall molding having at its upper end an outwardly divergent, transversely extending lip and below the lip an outwardly projecting, transversely extending shoulder which rests on the transversely extending shoulder along the upper end of said one of the panels of the outer U-shaped bottom wall molding, said lip providing in conjunction with the end panel at the upper end of said outer U-shaped bottom molding, a transversely extending open locking groove narrower at the top than at the bottom and an articulated closure member comprising a plurality of spaced, parallel, transversely extending narrow slats integrally joined along their longitudinal edges by hinge means and of a length corresponding to a distance between the bottoms of the first groove disposed in the space between the outer and inner U-shaped bottom wall moldings with their opposite ends slidingly engaged with said first grooves for movement in said first grooves from a position concealed within the space between the outer and inner U-shaped bottom moldings to a position covering the open top of the structure, said closure having along one end a latch adapted to be forced into the locking groove to lock the closure in its closed position and a part extending outwardly therefrom which provides a fingerhold by means of which the latch may be engaged with and disengaged from said locking groove and said wall panels having at their inner sides longitudinally spaced, parallel, vertically disposed slots for removably

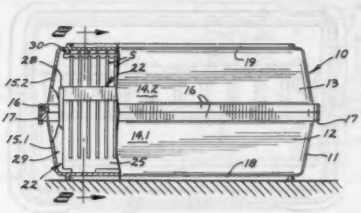
receiving panels to divide the interior into a plurality of compartments and panels mounted in said slots.

4,061,228

SHIPPING CONTAINER FOR SUBSTRATES

Douglas M. Johnson, Waconia, Minn., assignor to Fluoroware, Inc., Chaska, Minn.

Filed Dec. 20, 1976, Ser. No. 752,786
Int. Cl.² B65D *85/48*
U.S. Cl. 206—454 **18 Claims**



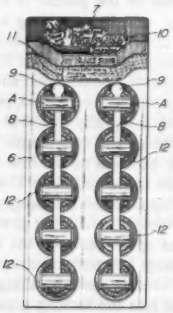
1. A shipping container for substrates comprising:
an elongate rigid box to extend horizontally and including a removable cover defining the top wall of the box;
means in the box defining a plurality of upright slots spaced at regular intervals from each other to receive such substrates and hold the substrates in upright position; and
an elongate substrate-retaining cushion including an elongate stiff panel of resiliently yieldable plastic material and lying along the inside of said top wall to confront the top edges of the substrates, one face of the panel facing upwardly and confronting the top wall of the box and having a plurality of elongate resiliently flexible ribs standing on edge and in edgewise engagement with the adjacent top wall, said ribs being flexed to continually urge the panel away from the top wall, and the lower face of the panel confronting and engaging the upper edges of the substrates and bearing downwardly thereon and having depending and spaced lugs extending between the substrates and preventing transverse movement thereof.

4,061,229

DISPLAY DEVICE FOR BICYCLE BRAKE SHOES

Norio Ohtsuka, Ayase, Japan, assignor to Bridgestone Cycle Industry Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1976, Ser. No. 662,731
Claims priority, application Japan, Jan. 7, 1976, 51-506
Int. Cl.² B65D *85/68, 73/00*
U.S. Cl. 206—486 **1 Claim**



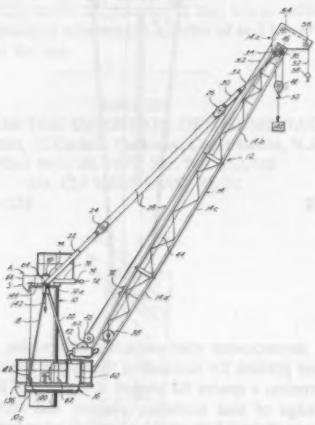
1. A display device for bicycle brake shoes, each of said shoes having a metal brake holder provided on one side with a brake rubber and on its opposite side with a single mounting screw with at least one washer and a nut engaged thereon, said display device comprising:
a longitudinally extending elongate plate-shaped body provided at its upper portion with a hanger hole and below said hanger hole with a plurality of vertically arranged longitudinal grooves;
each of said grooves having a width which is slightly larger than the diameter of said mounting screw and smaller than the outer diameter of said washer and said nut;
each said longitudinal groove being formed at its top end with an enlarged opening which is slightly larger than said outer diameter of said washer and nut whereby the assembled brake shoes may be placed on and removed from said device without removal of said nut and bolt;
said longitudinally extending elongate plate-shaped body being provided above said longitudinal grooves with a blank area adapted to receive advertising indicia, and along the length of said longitudinal grooves with vertically spaced printed marks, said brake shoes being secured to said device with said nuts tightened to hold the shoes in position over said printed marks vertically spaced from one another.

4,061,230

CRANE CROSSHEAD ASSEMBLY MOUNTED ON A PEDESTAL

John B. Goss; William D. Morrow, both of Houston, Tex., and Jack William Corbett, Lafayette, La., assignors to Pedestal Crane Corporation

Filed Jan. 8, 1976, Ser. No. 647,367
Int. Cl.² B66C *23/84*
U.S. Cl. 212—70 **5 Claims**



1. In a crane having a boom adapted to be mounted on a pedestal, the pedestal having an upper end, a crane mounting system comprising:
a crosshead assembly for connection to the crane boom and adapted to be rotatively mounted in proximity to the upper end of the pedestal;
bearing means with the upper end of the pedestal for allowing rotation of said crosshead assembly about the longitudinal axis of the pedestal, said bearing means including a pair of arcuate sections mounted with the upper end of the pedestal in spaced relationship from the longitudinal axis of the pedestal at the upper end of the pedestal for providing for limited lateral and pivotal movement of said crosshead assembly relative to the longitudinal axis of the pedestal;
a support column mounted with the upper end of the pedestal and extending upwardly therefrom, with the longitudinal axis of said support column being in substantial align-

ment with the longitudinal axis of the pedestal, said support column being receivably mounted between said arcuate sections, said crosshead assembly being rotatably mounted about said support column; and,

a substantially rectangular mounting plate for mounting said arcuate sections therewith and having an opening formed centrally thereof, said plate adapted to be disposed about said support column with said support column being within said opening of said mounting plate, said mounting plate being mounted within a rectangular opening centrally formed in said crosshead assembly for limited lateral movement of said crosshead assembly with respect to the pedestal.

4,061,231

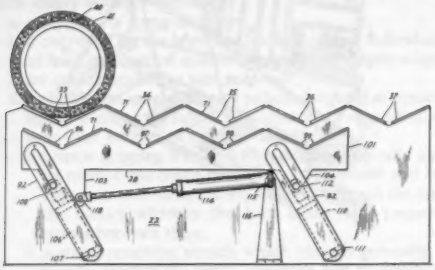
PIPE HANDLING APPARATUS FOR PIPE LAYING BARGES

J. C. Birdwell, Houston, Tex., assignor to Midcon Pipeline Equipment Co., Houston, Tex.

Division of Ser. No. 592,170, July 1, 1975, Pat. No. 3,984,007. This application June 10, 1976, Ser. No. 694,890

Int. Cl.² B65G *25/02*

U.S. Cl. 214—1 P **6 Claims**



1. Pipe lifter conveyor apparatus, comprising, in combination, a generally horizontally disposed elongate pipe lift beam having an upwardly facing pipe seat means at each end thereof adapted to support a pipe disposed thereon transversely of said pipe lift beam, said pipe lift beam having a pivotal connection adjacent each end thereof, a pair of first drive cylinder means each pivotally connected to one of said pivotal connections of said pipe lift beam at its upper end and each being stationarily pivotally supported beneath said pipe lift beam at its lower end, generally horizontally disposed second drive cylinder means disposed generally parallel to said pipe lift beam and having a pivotal connection to said pipe lift beam at one of its ends and having its other end stationarily pivotally supported, said first drive cylinder means being adapted to independently move said ends of said pipe lift beam in pivotal directions of said first drive cylinder means, said second drive cylinder means being adapted to move said pipe lift beam longitudinally, said first and second drive cylinder means being adapted to cooperatingly move said pipe lift beam to selectively move either one of said pipe seat means between a common central position and extended positions at its end of the apparatus, whereby a pipe may be selectively moved by said apparatus between any of said extended positions at either end of said apparatus and said common central position.

4,061,232

RECTILINEAR TRANSPORT MEANS

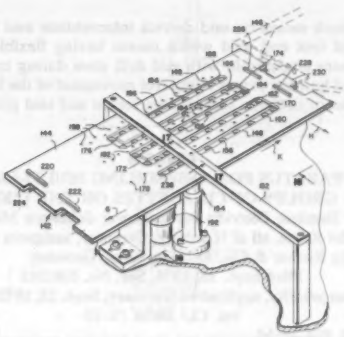
Ralph A. Sickles, P.O. Box 3396, Scottsdale, Ariz. 85257

Continuation-in-part of Ser. No. 606,229, Aug. 20, 1975, abandoned. This application Dec. 8, 1976, Ser. No. 748,643

Int. Cl.² B65H *29/38*

U.S. Cl. 214—1 BB **19 Claims**

1. In a rectilinear transport means; a stationary frame; a rotary actuator rotatably mounted on said frame on a stationary axis of rotation; indexing means moveably mounted on said frame to move in four directions relative thereto; two of said four directions being substantially at right angles to two of the remaining directions; said indexing means having a generally rectangular array of indexing portions; said indexing portions being spaced generally equally relative to each other and disposed in rows; said rows having adjacent respective opposite ends, said rows being substantially straight and said rows being spaced apart from each other substantially equal distances; lateral displacement means operable by said rotary actuator and at the ends of said rows; said lateral displacement means disposed to shift said indexing means in a direction laterally relative to said rows and to shift said indexing means a distance substantially equal to the distance between said rows; said lateral displacement means operable by a movement of said rotary actuator to an end of one of said rows; said rotary actuator having means disposed and adapted successively to



engage and move one of said indexing portions with each revolution of said rotary actuator; said rotary actuator disposed to move said indexing means a distance equal to the distance between said indexing portions; and a single revolution control means disposed and adapted to drive said rotary actuator one revolution at a time; the indexing portions of adjacent ones of said laterally spaced apart rows of said indexing portions being disposed substantially 180° out of phase with each other relative to said rotary actuator and thus disposed for engagement with said rotary actuator whereby said rotary actuator continually rotates in one direction and drives one of said rows rectilinearally in one direction and successively drives the adjacent row of indexing portions rectilinearally in the opposite direction each time said lateral displacement means shifts said indexing means laterally relative to said rows and from an end of one row to a respective end of said adjacent row.

4,061,233

DRILLING RIGS

Joseph Reginald Benjamin, Fifth Floor, 38 Savile Row, London, W1X 2QU, England

Filed June 28, 1976, Ser. No. 700,478

Claims priority, application United Kingdom, July 4, 1975, 28401/75

Int. Cl.² E21B *19/14*

U.S. Cl. 214—2.5 **6 Claims**

1. A drilling apparatus comprising, in combination

a. a pile having an axis inclined to the vertical in a plane of inclination;

b. a drill string within said pile;

c. a frame mounted on said pile;

d. a derrick having a foot end and a head end, said foot end pivotally mounted to said frame for angular movement of said derrick in said plane of inclination;

e. drill stem storage means having access means positioned angularly below said pile axis;

f. derrick adjustment means operable to move said derrick

head end between a position vertically above said access means and a position on said pile axis;

g. hoisting means on said derrick operable to transfer drill stem from said storage means to said pile with the lower end of said drill stem always positioned in the space angularly below said pile axis; and

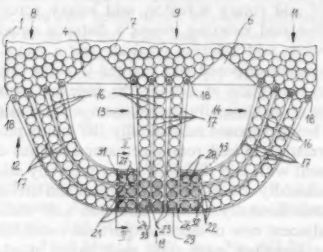
h. winch means on said derrick intermediate said head and said foot end, said winch means having flexible hauling means engageable with said drill stem during transfer by said hoisting means to control movement of the lower end thereof between said storage means and said pile.

4,061,234

APPARATUS FOR ASSEMBLING MULTI-LAYER GROUPS OF CIGARETTES OR THE LIKE

Jürgen Bantien; Dietrich Bardenhagen; Johannes Mielke, and Friedel Kruse, all of Hamburg, Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Sept. 23, 1974, Ser. No. 508,392
Claims priority, application Germany, Sept. 22, 1973, 2347781
Int. Cl.[2] B65B *19/10*
U.S. Cl. 214—6 M **12 Claims**



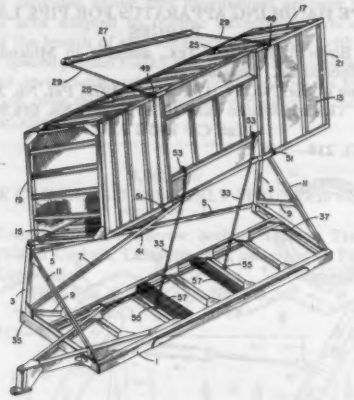
1. Apparatus for assembling multi-layer blocks consisting of predetermined numbers of cigarettes or analogous rod-shaped articles, particularly for arraying rod-shaped articles in the form of blocks which are ready for packing, comprising a magazine for a supply of parallel rod-shaped articles; first and second article feeding means respectively including a first and a second group of ducts having inlets communicating with said magazine and end portions remote from and located at a level below said inlets so that each of said ducts slopes downwardly, at least in part, intermediate said inlet and said end portion thereof to allow the articles of said supply to descend therein by moving sideways and to form in the respective end portion a row of adjacent parallel articles, said end portions of said first group of ducts being spaced apart from said end portions of said second group of ducts; and third article feeding means including at least one additional duct having an inlet communicating with said magazine and an end portion located at a level below said last mentioned inlet, the end portion of said additional duct being disposed between and being inclined with respect to the end portions of said first and second groups of ducts and the articles which enter the inlet of said additional duct and descend therein by moving sideways forming in said end portion of said additional duct an additional row of parallel articles; and means for expelling the rows of articles from said end portions at such intervals that said end portions are refilled with rows of articles between successive expulsions, said expelled rows forming a block or rod-shaped articles.

4,061,235

VEHICLE WITH SIDE DUMPING MECHANISM OVER THE TOP RAIL

Diego Rolando Suarez, Coral Gables, Fla., assignor to Inter-American Transport Equipment Company, Miami, Fla.

Filed Dec. 16, 1976, Ser. No. 751,191
Int. Cl.[2] B65G *67/24*
U.S. Cl. 214—64 **11 Claims**



1. A side dumping container vehicle comprising:

a. a chassis having front, rear and side portions;

b. a pair of side dumping arms each connected to the front and rear portions of the chassis near one side portion of said chassis,

c. means for reinforcing said pair of side dumping arms to said chassis,

d. a rigid container comprising a base, a side dumping siding forming one side of the container, front and rear sidings, and a lifting siding forming a side of the container opposite the side dumping siding, wherein said container is supported by said chassis with the side dumping siding adjacent said pair of side dumping arms,

e. pivot means for pivotally connecting said side dumping siding of said container to said pair of side dumping arms,

f. supporting means for supporting a lifting bar mounted on said lifting siding, said supporting means comprises a pair of hook shaped members attached to said lifting siding near the top of said lifting siding,

g. a lifting bar adapted to be supported by said supporting means, said lifting bar comprises an elongated bar having a length greater than the distance between said pair of hook shaped members so as to be received and supported by said hook shaped members, and adapted to be lifted from said hooked shaped members by a lifting device,

h. means for interconnecting said lifting bar to said container, whereby movement of said lifting bar away from said supporting means pivots said container about said pivot means for dumping the contents of said container, wherein said means for interconnecting said lifting bar to said container comprises plural cable means being connected at one end to said lifting bar and being connected at its other end to said container, and

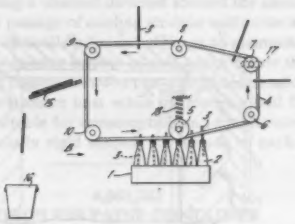
i. limiting means for limiting the pivotal movement of said container during dumping.

4,061,236

APPARATUS FOR REMOVING DRINKING STRAWS FROM BOTTLES

Moshe Schneerson, 189a Assirey Zion St., Kiryat Sharet, Raanana, Israel

Filed May 12, 1976, Ser. No. 685,795
Int. Cl.[2] B65B *21/18*
U.S. Cl. 214—309 **13 Claims**



1. An apparatus for removing projecting drinking straws from empty bottles comprising:
   a. a supporting frame structure,
   b. a conveyor for the bottles either in a case or individually,
   c. at least one pair of endless straw-gripping belts adapted for movement above said conveyor,
   d. a plurality of spaced pairs of pulleys mounted at predetermined position on said frame structure for guiding said belts over a series of stretches as follows:
      i. a straw-gripping stretch which extends generally parallel relative the bottle conveyor and in which said belts approach each other closely as they approach the top of the bottles whereby the belts clamp said projecting straws between them;
      ii. a straw-removing stretch which extends generally upwardly relative the bottle conveyor and in which said belts move together in close juxtaposition and remove said straws from said bottles;
      iii. a straw-holding stretch which extends generally normal to and then substantially parallel to the bottle conveyor and in which the belts are close together and hold said straws between them, and
      iv. a straw-ejecting stretch which extends generally normal relative the bottle conveyor and in which said belts are separated to release said straws;
   e. means to separate said belts in said last-mentioned stretch, said last-mentioned stretch joining at its end with the beginning of the first-mentioned stretch.

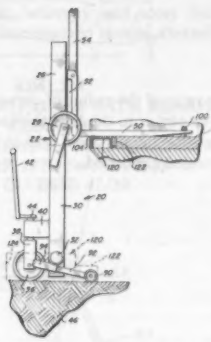
4,061,237

FORKLIFT TRUCK

Stephen R. Austin, Winnetka, and George J. Stevenson, Wilmette, both of Ill., assignors to The Brevet Corporation, Glenview, Ill.

Filed July 10, 1975, Ser. No. 594,634
Int. Cl.[2] B60P *1/64*
U.S. Cl. 214—515 **33 Claims**

1. In apparatus for storing a mobile forklift truck on top of a raised platform, such as a loading dock or the platform bed of a conventional motor truck, said forklift truck including a frame assembly comprising a horizontal base member with a vertical frame member mounted thereon, main support wheel means and drive wheel means carried by said frame assembly to move the forklift truck about in use, a fork with a pair of generally horizontal tines mounted on said vertical frame member at the front end thereof, lifting means for raising and lowering said fork tines on said vertical frame member, and drive means for actuating said lifting means to raise and lower said fork selectively, said forklift truck being collapsible from an operative condition in which said main support wheel means projects forward beyond said vertical frame member to a storage condition in which said main support wheel means is located substantially entirely behind the forwardmost portion of said vertical frame member and said tine lifting means, the improvement which comprises:
   a pair of stirrups mounted on top of said raised platform adapted to receive said tines, each of said stirrups being spaced from the edge of said platform a distance that is less than the distance to which said tines extend beyond the forwardmost portion of said vertical frame member, said tine lifting means, and said main wheel support means when the forklift truck is in its said collapsed condition; and
   a collapsible support arm mounted on said raised platform movable between an out-of-the-way position and an operative position in which it is substantially level with the top of said platform,



whereby when said fork tines are positioned in said stirrups, said forklift truck is put into its said storage condition, said fork tines are lowered far enough with respect to said vertical frame member that said frame assembly with said drive wheel means is raised to the level of said platform top, and said collapsible support arm is moved into its operative position where it engages the rearmost wheel means carried by said frame assembly, actuating said drive wheel means in contact with one of said support arm and said raised platform will then cause the forklift truck to move forward upon the platform until said tines are fully inserted in their respective stirrups and said forklift truck is positioned entirely within said platform edge.

4,061,238

LOAD CARRYING FORK FOR AN INDUSTRIAL VEHICLE

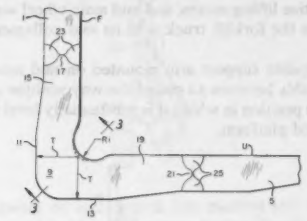
William L. Cunningham, and Duane W. Graham, both of Portland, Oreg., assignors to Hyster Company, Portland, Oreg.

Filed Nov. 20, 1975, Ser. No. 633,828
Int. Cl.[2] B66F *9/14*
U.S. Cl. 214—750 **1 Claim**

1. A load carrying fork for use with an industrial vehicle comprising:
   an L shaped member having a vertical shank and a horizontal shank, said shanks each having load engaging surfaces;
   means on the upper end of the vertical shank for attaching the fork to the vehicle;
   a generally cylindrical groove extending transverse to the longitudinal central axis of the horizontal shank and located at the intersect of the vertical and horizontal shanks, the groove having a first end, a second end and a center, the groove further having a longitudinal central axis defined by a straight line, said groove central axis being normal to the longitudinal central axis to the horizontal shank, the groove defining an undercut below the load engaging surfaces of the vertical and horizontal shanks, said intersect further defining the heel of the fork;

the perpendicular distance from the bottom of the horizontal shank to

the surface of said center of said groove defining the thickness of said heel, the radius of curvature of said groove at said center being greater than at said first and second end of said cylindrical groove;



and the ratio of the radius of curvature of the groove at the groove center to the heel thickness having a value in the range substantially from 0.25 to 1.0 so that stresses in the intersect are reduced.

4,061,239
CLOSURE FOR A CONTAINER

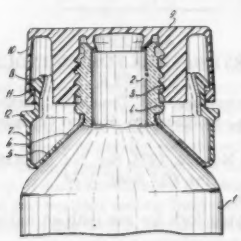
Frans A. W. Tasseron, Heemstede, Netherlands, assignor to Koninklijke Emballage Industrie Van Leer B.V., Amstelveen, Netherlands

Filed Dec. 10, 1976, Ser. No. 749,515

Claims priority, application Netherlands, Dec. 12, 1975, 7514516

Int. Cl.[2] B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—221 **2 Claims**



1. In a closure for a container having a neck provided with screw threads formed on the exterior surface of said neck and a cap screwed on said neck, said cap in its closure position engaging an annular body which is locked in a groove of the neck beneath the screw thread thereof, the improvement comprising the cap having a wall, said wall with the threaded part of the cap constituting an inverted U-shaped hollow space, said wall having an inwardly facing edge, and the annular body having an upwardly directed flexible wall, said wall projecting into the U-shaped hollow space and having a plurality of outwardly extending hooks engaging with the inwardly directed edge of said wall.

4,061,240
CLOSURE CAP AND CONTAINER

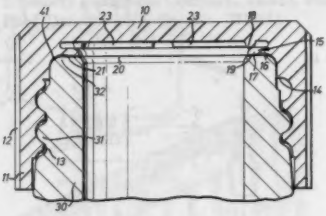
Thomas Duncan Brownbill, London, England, assignor to John Dale Limited, London, England

Filed June 14, 1976, Ser. No. 695,446

Claims priority, application United Kingdom, June 13, 1975, 25389/75; July 4, 1975, 28289/75; Aug. 13, 1975, 33745/75

Int. Cl.[2] B65D *53/00*

U.S. Cl. 215—270 **6 Claims**



1. A closure cap in combination with a container which has a neck provided with a dispensing opening, said cap comprising

a crown and an annular skirt depending from the crown, means on the skirt securing the cap to the container neck with the crown disposed across said opening,

a flexible annular sealing ring integral with the cap and inclined inwardly towards the axis of the cap, said ring having an annular extremity in sealing contact with the top of said container around said opening, and

a segmented support ring disposed on the crown within the space between the sealing ring and the inner surface of the crown whereby the sealing ring is pressed thereagainst when the sealing ring engages the container, said segmented ring permitting fluid under pressure to escape from the container into the space between the sealing ring and the crown where it is confined and urges the sealing ring against the container.

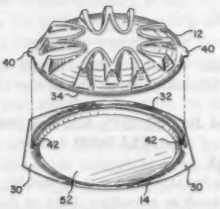
4,061,241
FOOD PLATE PACKAGE

Andrew G. Retelny, Wheaton, Ill., assignor to McDonald's Corporation, Oak Brook, Ill.

Filed Sept. 27, 1976, Ser. No. 727,293

Int. Cl.[2] B65D *1/34, 43/10;* **A45C** *11/20*

U.S. Cl. 220—4 B **9 Claims**



1. A package of lightweight thermoplastic material for use in the storage of heated foods, said package being effective to maintain the heat and flavor of hot food contained therein, said lightweight thermoplastic material normally deforming if a wall of said package reaches the temperature of said hot foods, as occurs when adjacent packages are stacked on each other without provision for the circulation of cooling air between said adjacent packages, said package comprising in combination, a plate, said plate being shaped to receive heated foods, a generally bowl-shaped cover adapted to cover said plate to maintain said foods in a heated condition, a plurality of ribs formed on an outside surface of said cover and being spaced

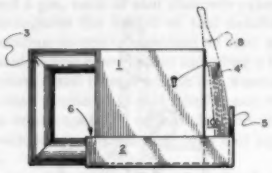
each from the other, each of said ribs being raised from said outside surface to form a planar upper surface, each of said planar upper surfaces of said plurality of ribs cooperating to form a substantially horizontal upwardly facing support surface to receive a plate of a similar package, each of said ribs having at least one generally U-shaped portion to form a bight, the bight of each of said U-shaped ribs generally extending toward the center of said cover from a point in close proximity to the periphery of said cover, the spacing between each of said ribs defining a channel directed toward the center of said cover to allow passage of cooling air over said cover and under the plate of a vertically adjacent package to maintain the temperature of the outside surface of said cover below that of the food contained therein, thereby preventing deformation of said cover due to excessive heat while maintaining said foods at a temperature suitable for consumption and simultaneously providing substantially rigid support for a stack of packages.

4,061,242

DRIPLESS PAINT CONTAINER

Joseph J. Donlon, 1240 Dauphine St., New Orleans, La. 70116

Filed Aug. 11, 1976, Ser. No. 713,446
Int. Cl.² B65D *1/36, 23/08, 25/28*
U.S. Cl. 220—90 **9 Claims**



1. A dripless paint container, comprising:
a. a rectangular drip catching pan having a closed bottom and sidewalls; and
b. rectangular holding means for holding paint having a closed bottom and side walls, said holding means being, mounted within said drip catching pan, the side walls of said holding means spaced from the side walls of said drip catching pan, the central and vertical, longitudinal axis of said holding means offset from but parallel to the central and vertical, longitudinal axis of said drip catching pan, said holding means having horizontal cross-sectional dimensions smaller than the cross-sectional dimensions of said drip catching pan, said drip catching pan providing an offset drip catching surface completely surrounding said holding means.

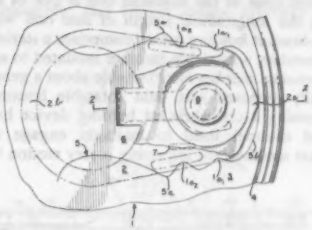
4,061,243

END CLOSURE WITH VARIABLE SIZE POUR OPENING

Nick S. Khoury, Worth, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Nov. 2, 1976, Ser. No. 737,960
Int. Cl.² B65D *41/32*
U.S. Cl. 220—269 **9 Claims**

1. An easy-opening end closure for a can or similar container, arranged and adapted to permit a selection from among a succession of increasingly sized pour opening, said closure comprising an end panel, a score line formed in said end panel and defining therein an openable flap, an opening member attached to said end panel and adapted to rupture said score line and open said flap consequent to a displacement of said member, and means included in said end panel and co-operative with said opening member to progressively vary the force required to open the closure, said force varying means comprising at least one portion of said end panel, exclusive of said openable flap, disposed in obstructing relation to said opening member and limiting rupture of said score line to a predetermined portion thereof, said end panel portion being deflectable to a non-obstructing position upon application of a predetermined force thereagainst, whereby said score line may be ruptured beyond said predetermined portion thereof.

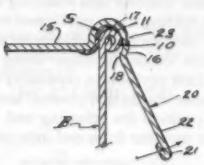


4,061,244

COMBINATION CONTAINER WITH REMOVABLE CLOSURE

John A. Tucker, 14745 Erwin St., Van Nuys, Calif. 91411

Filed Nov. 19, 1976, Ser. No. 743,330
Int. Cl.² B65D *41/10*
U.S. Cl. 220—310 **4 Claims**



1. A container and removable interlocked closure of circular form; the container being comprised of a base and an upstanding perimeter wall defining an open topped fluid tight vessel, a circumferential and outwardly disposed peripheral bead in a normal plane at the open top of the container, the closure being comprised of a wall engaged with the bead and a rim circumferentially coextensive with and conforming to said bead and with a ridge continuously underlying the said bead to interlock therewith, seal means disposed between the closure wall and the bead, and a circumferentially continuous conical skirt depending divergently from the said ridge and presenting a manually engageable edge remote from the rim for outward upward deflection deforming the rim and causing it to revolve the ridge outward from the bead in opposite circumferential directions from any point of deflection to thereby release the closure from the container.

4,061,245

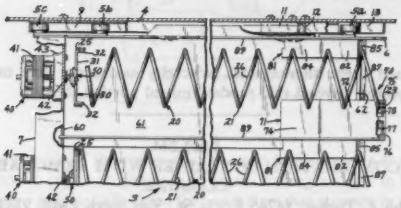
HELICAL COIL DISPENSING MACHINE APPARATUS

Joseph A. Lotspeich, Eagen, Minn., assignor to Gross-Given Manufacturing Company, St. Paul, Minn.

Filed Mar. 22, 1976, Ser. No. 669,348
Int. Cl.² G07F *11/36*
U.S. Cl. 221—75 **26 Claims**

1. Mounting apparatus for an elongate helical coil of the type used in dispensing machines, comprising:
a. an elongate helical coil having a longitudinally extending coil axis and defining an internal cylindrical zone coaxial with said coil axis;
b. a cross-bracket member mounted to one end of said coil, having a portion thereof disposed across the diameter of said coil; and
c. cross-bracket holding means cooperatively detachably engaging said cross-bracket member for detachably rotat-

ably mounting said coil in quick-release manner for rotation about said coil axis, such that said axis is generally disposed in a horizontal plane, whereby said internal cylindrical zone of the mounted coil is free of obstruction along the longitudinal length of said coil wherein said cross-bracket holding means comprises a stationary housing member; a rotatable member mounted to said stationary housing member and rotatable about a generally horizontally disposed axis, said rotatable housing member comprising a cross-bracket holding device having a recessed channel sized to matingly engage said cross-bracket member, for imparting rotary motion thereto and



retaining means mounted for rotation with said rotatable housing member, for releasably securing in quick-release manner said cross-bracket member into cooperative engagement with said recessed channel in said cross-bracket holding device, wherein said retaining means comprises a plurality of retaining clips, positioned on opposite sides of said channel and being operable between first and second positions, said retaining clips being normally biased toward said first position to retainably engage said cross-bracket member within said channel and being movable to said second position for releasing and for accepting said cross-bracket member from and into retention within said channel.

4,061,246

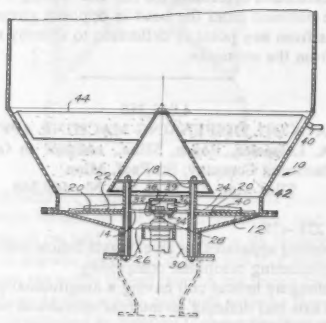
CONTROLLED FEEDING OF POWDERS TO CONVEYING SYSTEMS AND PROCESS

Frank J. Miksitz, Phillipsburg, N.J., assignor to UFI Engineering & Manufacturing Co., Inc., Bethlehem, Pa.

Continuation-in-part of Ser. No. 563,453, March 31, 1975, Pat. No. 4,015,747, which is a continuation-in-part of Ser. No. 467,558, May 6, 1974, Pat. No. 3,874,566, which is a continuation-in-part of Ser. No. 216,105, Jan. 7, 1972, Pat. No. 3,809,286. This application July 16, 1975, Ser. No. 596,430

Int. Cl.[2] B65G *65/34*

U.S. Cl. 222—1 **9 Claims**



1. A method for feeding finely divided powdered material from a mass of the powder maintained in an upper zone downwardly into a lower zone by gravity assist through a feed device which mechanically urges a stream of the powder through a feed aperture at a controlled rate, said method comprising providing a shroud within the powder in the upper zone, disposing a horizontal annular plate below the shroud with powder in the form of an annular mass thereof residing on the upper surface of the plate, injecting a gas upwardly into the mass of material at a location above the shroud to agitate the powder to render it free flowing by gravity while maintaining at the annular plate a stable mass of the powder, and orbiting the plate in a horizontal plane thereby urging powder only from the stable mass thereof inwardly toward and through the aperture in the plate along a path which moves in a horizontal plane around the periphery of the aperture in the plate, whereby the injected gas does not cause uncontrollable delivery of fluidized powder to the plate and whereby the plate maintains control over the rate at which the powder flows through the feed aperture.

4,061,247

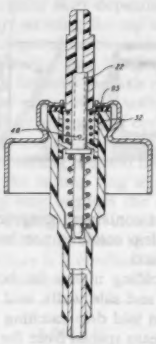
METHOD OF AND APPARATUS FOR CONTROLLING OF TRAVEL OF THE PLUNGER IN A DISPENSING PUMP CHAMBER

Philip Meshberg, 85 Old Oaks Road, Fairfield, Conn. 06430

Continuation-in-part of Ser. No. 339,129, March 8, 1973, abandoned. This application Nov. 20, 1975, Ser. No. 633,798

Int. Cl.[2] G01F *11/38*

U.S. Cl. 222—1 **6 Claims**



1. In a finger operated pump for dispensing material from a container, said pump including a pump chamber, a cylindrical piston member having at least one horizontal cross-sectional portion with a central opening therein, disposed in said chamber for movement therein, a stem for moving said piston member downward having a discharge channel therein comprising a first upper portion of first outer diameter larger than said opening and a second portion of an outer diameter slightly smaller than said opening inserted through said opening, a stop at the bottom of said second portion of a size larger than said opening abutting against said horizontal portion when said pump is unoperated; a first spring acting against said stop and biasing said piston upward; first valve means at the bottom of said chamber for establishing communication between said chamber and the material to be dispensed in the container, said first valve arragned to close on initial actuation of said stem, and second valve means for establishing communcation between said chamber and said discharge channel in said stem, said second valve means being formed by cooperating portions of said second stem portion and said horizontal portion, said second valve means operable to establish communication between said channel and said chamber only after a predetermined movement of said stem downward, a method of improving the evenness of dispensing comprising interposing a second spring between said first stem portion and the top of said horizontal portion whereby during the initial actuation when said first valve is closed and said second valve opened said spring will be compressed prior to opening of said second valve and store energy to create a prepressurization in the stem mecha-

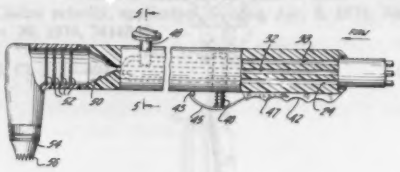
nism which will result in smooth dispensing even if the stem is not smoothly actuated.

4,061,248

MULTI-FLAVOR WHIP CREAM APPARATUS

Vincent Arena, R.R. No. 1, Box 82A-3, Stockholm, N.J. 07460

Filed Sept. 7, 1976, Ser. No. 721,313
Int. Cl.[2] B67D *3/00*
U.S. Cl. 222—4 **2 Claims**



1. An apparatus for the mixing and dispensing of a plurality of flowable, aerated, comestible materials, comprising:

a. an elongated handle element having therein three longitudinal channels, and an output nozzle located on one end thereof, two of said channels providing, respectively a liquid and a gas, each of said channels extending substantially throughout the length of said handle element and corresponding to one component of said materials to be mixed, said handle element also including a first transverse bore located distal to said nozzle and a second transverse bore located proximal to said nozzle, said first bore positioned in contact with all of said channels and said second bore positioned in contact with only said liquid providing channel,

b. a plunger positioned in said first bore having a plurality of transverse channels, said channels corresponding in position and cross-section to said longitudinal channels of said handle element, said plunger also including a biasing means externally mounted about said plunger and protruding from said handle element, wherein a selectable open-close function of said channels is obtained through the application of external pressure to said biasing means;

c. an overrun control valve having a channel corresponding in position and cross-section to said liquid-containing channel, said valve disposed within said second transverse bore wherein, upon rotation of said valve, the ratio of gas to liquid and, thereby, the consistency of the end-product can be regulated; and

d. a blending area located intermediate said channels and said nozzle, said blending area comprising a singular channel axially integral with said longitudinal channels and providing the junction thereof, and a conically diverging, increased diameter expansion chamber integral with said singular channel, said expansion chamber promoting the homogeneous mixture of said materials

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4,061,249

AEROSOL DISPENSER RING

Dale Maxwell Smith, 99 Copeland Road, NE., No. D-16, Atlanta, Ga. 30342

Filed Jan. 26, 1976, Ser. No. 652,215
Int. Cl.[2] B65D *83/14*; E05G *1/12*
U.S. Cl. 222—78 **5 Claims**

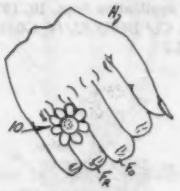
5. A dispenser ring for dispensing aerosol adapted to be worn on the hand of the user comprising:

a ring band adapted to fit on the finger of the user's hand;

a mounting on said ring band;

a dispenser assembly carried by said mounting, said dispenser assembly including an aerosol reservoir, a supply of aerosol carried in said aerosol reservoir under pressure;

a discharge valve assembly communicating with said supply of aerosol in said reservoir to selectively discharge the aerosol when said valve assembly is activated, a camouflaging member substantially covering said aerosol reservoir and said discharge valve assembly to camouflage same; and trigger means for selectively activating said valve assembly; said trigger means pivotally mounted



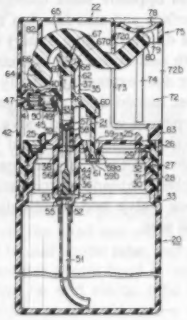
adjacent said reservoir and including an operating element projecting out from said camouflaging member to be manually engaged by the user to activate said valve assembly.

4,061,250

DEPRESS BUTTON TYPE SPRAYER

Tetsuya Tada, 2-6, 3-chome, Nishinakanobu, Shinagawa, Tokyo, Japan

Filed May 25, 1976, Ser. No. 689,750
Claims priority, application Japan, May 31, 1975, 50-65533; Nov. 26, 1975, 50-160023[U]
Int. Cl.[2] B05B *9/043*
U.S. Cl. 222—321 **9 Claims**



1. A depress button sprayer comprising:

a spray body provided with a cylinder having an opening at one end;

a piston slidably mounted in a liquid-tight fashion in the cylinder;

spring means for urging the piston outwardly of the cylinder;

a nozzle in communication with the cylinder and having a dispensing hole for jetting a liquid from within the cylinder;

a pivotable lever coupled to the piston for sliding the piston into the cylinder against the force of the spring means, the lever having a rounded free end;

a pivot for pivotally supporting the lever in a position spaced from the axis of the piston;

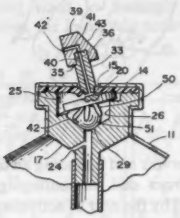
a cap housing for covering the spray body and the lever, the cap housing having a longitudinally extending recess at the rear upper portion thereof; and

a depress button slidably received in the recess and drivingly point-contacted with the rounded free end of the lever.

4,061,251
METERED VALVE ASSEMBLY FOR DISPENSING DEVICES

Arthur M. Harris, c/o S.G. Militana, 9301 NE. 6th Ave., Miami Shores, Fla. 33138

Continuation-in-part of Ser. No. 396,122, Sept. 10, 1973, abandoned. This application Sept. 10, 1973, Ser. No. 396,123
Int. Cl.[2] B65D *83/14;* G01F *11/28*
U.S. Cl. 222—402.2 3 Claims



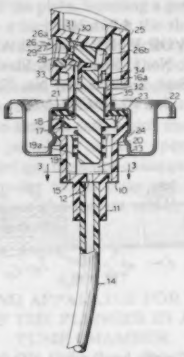
1. In a receptacle for pressurized liquid having a cap portion, a resilient valve seat adjacent said cap portion, a rigid valve disc in contact relation with said resilient valve seat, an opening in said cap and said resilient valve seat for the passage of liquid under pressure from said receptacle, a valve housing mounted in said receptacle, said housing having a chamber, a second valve seat and an inclined shoulder, said valve disc engaging said shoulder at the highermost position as a fulcrum, a valve stem secured to said valve disc extending upwardly through said openings, an actuator mounted on said valve stem, said actuator having a discharge outlet and a thumb receiving surface on opposite sides thereof, said outlet, said thumb receiving surface and said fulcrum being in substantial coplanar relation, a duct extending axially of said valve stem communicating with said outlet and terminating adjacent said valve disc, a further duct extending radially of said valve stem connecting said first named duct and engaging said resilient valve seat at said opening when said valve disc is in a closed position, a check valve positioned in said valve chamber on said second valve seat and a plurality of elongated and substantially resilient members extending from said rigid valve disc engaging said check valve and yieldingly maintaining said check valve on said seat.

4,061,252
AEROSOL DISPENSER USING BUTANE PROPELLANT

Pasquale R. Riccio, Salem, N.H., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 9, 1976, Ser. No. 665,313
Int. Cl.[2] B65D *83/14;* F16K *31/58*
U.S. Cl. 222—402.18 6 Claims

1. A dispensing means for a butane aerosol dispenser, comprising a hollow support, a dip tube depending from the central portion of the bottom of the support and opening into the interior of the support, the bottom surface of said support having at lease one propellant inlet aperture at the periphery thereof, a pushbutton having a depending sleeve with the lower end movable into and out of the support, nozzle means in said pushbutton, said pushbutton having a supply passage from the interior of said sleeve to said nozzle means, said support and sleeve having a mixture flow path therethrough and gasket means in said flow path for opening said flow path when said sleeve is moved into said support, and annular passage defining means along said flow path in said support and

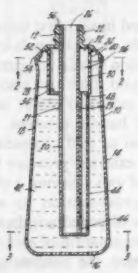


sleeve for defining an elongated annular passage for expansion of the butane propellant as it passes along said flow path.

4,061,253
METERING DISPENSING BOTTLE

Winston C. Rockefeller, Woodcliff Lake, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,865
Int. Cl.[2] G01F *11/26*
U.S. Cl. 222—442 10 Claims



1. A container for the repetitive dispensing of substantially equal predetermined quantities of liquid comprising a first container having a bottom portion, sidewall portion and an open-ended neck portion, a second container disposed at least substantially within the first container and depending from the neck portion thereof comprising an elongated tubular member open ended at the upper extremity and closed at its bottom, a third-container disposed completely within said first container, integral with and disposed substantially concentrically around said second container to form an annular reservoir, said third container comprising sidewall, bottom and top portions which together form a fluid sealing enclosure, the top and bottom portions being integral with and supported by the outer surface of said second container, said third container communicating with said first container by means of an opening provided on the upper portion of said sidewall of said third container, said opening serving as a liquid inlet to said third container, and a second tubular member connecting the bottom portions of said second container with the bottom of said third container, and serving as a fluid passageway there between, said second tubular member having a volume substantially smaller than said third container whereby substantially the same quantity of liquid is repetively dispensed, and venting means for permitting air to escape from said third container, said venting means communicating with said first container and said third con-

tainer through said second container and said second tubular member.

4,061,254

DISPENSING VALVE

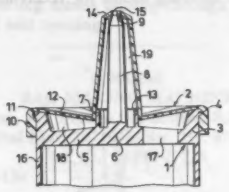
Billy N. Nilson, Mjolby, Sweden, assignor to KeNova AB, Malmo, Sweden

Filed Apr. 1, 1975, Ser. No. 564,080

Claims priority, application Sweden, Apr. 8, 1974, 7404749; Nov. 20, 1974, 7414566

Int. Cl.² B65D *5/72*

U.S. Cl. 222—494 **2 Claims**



1. A self-resetting pressure release valve opening in response to a predetermined pressure and closing upon release of said pressure comprising:

an integral diaphragm mounted at its periphery and having a discharge opening therein;

stem means extending toward said opening, said stem means being unbiased and having a portion in direct frictional contact with said diaphragm in the closed position of the valve, said diaphragm having a flexible body portion inclined inwardly from its periphery toward said stem means when the valve is in its closed position and moving outwardly through a planar position in response to pressure thereon in the direction of discharge; and

means for disengaging said diaphragm from said portion of said stem means substantially as said body portion of said diaphragm moves through its planar position, wherein said stem means further includes a projection and a support for said projection, said support having an outer rim and being provided with apertures between the outer rim and the projection, and said disengaging means including an annular flange formed on said support and in engagement with said diaphragm to isolate said discharge opening from said support apertures when said valve is in the closed position, said flange coming out of engagement with said diaphragm upon movement of the diaphragm to the planar position.

4,061,255

DRIP CONTROLLING SPOUT

Thomas R. Davies, 2850 Mesa Verde Drive E., Costa Mesa, Calif. 92626

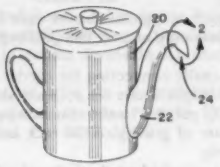
Filed Sept. 23, 1976, Ser. No. 725,791

Int. Cl.² B65D *25/42*

U.S. Cl. 222—566 **11 Claims**

1. The improvement in a spout affixed to a container for dispensing liquid therefrom comprising:

a spout formed from a single conduit having a passage completely enclosed along the length thereof from the entrance to the exit and having a downwardly displaced exit opening, wherein the terminus of the leading edge projects below the terminus of the trailing edge and said passage at the exit opening is formed in conduit walls of substantially uniform thickness so that liquid flowing



through said spout falls off the forward portion of the projecting rim provided by the leading edge.

4,061,256

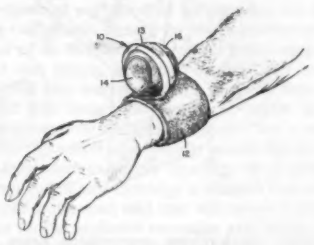
TENNIS BALL HOLDER TO BE WORN ON THE ARM

Irwin B. Beer, 7717 SW. 102nd Place, Miami, Fla. 33173, and Sanford Siegal, 7720 SW. 102nd Place, Miami, Fla. 33143

Filed Aug. 7, 1975, Ser. No. 602,801

Int. Cl.² A45C *11/00*

U.S. Cl. 224—5 D **4 Claims**



1. A holder for an object of relatively light weight and compact shape such as a tennis ball or the like, the holder adapted to be worn on the lower arm, comprising:

an elastic tube, fabricated of material containing a major element characterized by soft absorbency for comfort on the arm and absorbence of perspiration, and adaptable to be stretched over the hand and worn on the arm; and

a pouch attached to said elastic tube, said pouch including a substantially circular elastic band in relatively tangential attached position on said elastic tube for receiving and gripping the object to be held, and a shallow generally semi-circular loop of elastic material having its ends attached to said elastic band for supporting said object when in the pouch, and the width of the material of the loop being less than the diameter of said substantially circular elastic band for providing openings between the sides of said loop and said elastic band for application of pressure on the object in the removal of the object from the pouch,

the material of said elastic tube being of sufficient thickness and absorbency to deter the flow of perspiration therethrough to the object being held, and the elastic tube being of sufficient width to underlie the loop and cooperate therewith to prevent direct contact of the object with perspiration on the arm of the wearer.

4,061,257

CAR RACK FOR GOLF CARTS

Paul J. St. Clair, 737 Magnolia Ave., San Bruno, Calif. 94066

Filed July 16, 1976, Ser. No. 706,053

Int. Cl.² B60R *11/00*

U.S. Cl. 224—42.08 **15 Claims**

1. An apparatus for carrying golf bags and attached carts on the rear of a vehicle, comprising:

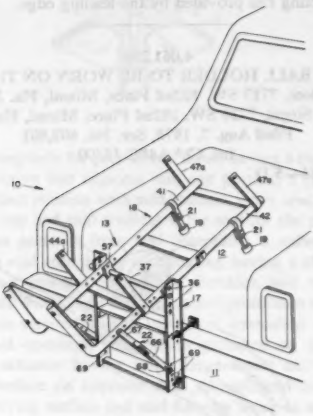
a bumper frame oriented generally vertically, having a pair of spaced side arms extending upwardly;

means affixing the bumper frame to the rear bumper of the vehicle;

a lightweight elongated carrier rack having means for securely retaining at least one golf bag and attached cart to itself;

means pivotally connecting the carrier rack to the side arms of the bumper frame for rotation about a horizontal axis generally parallel to the rear bumper and located below the center of gravity of the rack and attached golf clubs and carts;

pad means mounted on the forward side of the carrier rack toward its upper end for resting upon the vehicle's rear deck when the rack is pivoted forward; and



collapsible, quick-release compression brace means connected to the lower end of the carrier rack and to the lower part of the bumper frame, below said horizontal axis, for exerting an upward pushing force on the lower end of the rack so that the rack is tightly urged in the forward rotated direction to a forward position with the pad means tightly engaged against the vehicle rear deck, said compression brace means having a collapsed, relaxed position when said rack is in an upright position and an extended, locked compression position when said rack is in the forward position;

whereby the vehicle's rear deck may be raised and lowered with the carrier rack in the upright position, the golf clubs and carts may be easily loaded onto the carrier rack, and the loaded rack may be rotated to the forward position and locked to distribute weight between the bumper frame and the vehicle rear deck.

4,061,258

MOUNTING STRUCTURE FOR A VEHICLE ACCESSORY SUCH AS A CB RADIO OR THE LIKE

Charles E. Dysart, 3401 Caldwell Drive, Raleigh, N.C. 27600

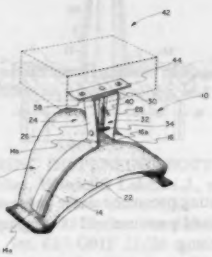
Filed May 25, 1976, Ser. No. 689,746

Int. Cl.[2] B60R *11/02*

U.S. Cl. 224—42.42 R **6 Claims**

1. A support assembly for receiving and supporting an accessory such as a CB radio, AM-FM radio, tape or cassette recorder, or the like, wherein said support assembly is adapted to extend over a raised floor portion of a vehicle and to support said accessory such that the same may be readily detached from said support assembly, said support assembly comprising:

a base support structure for extending over said raised floor portion of said vehicle and adapted to be securely clamped thereto, said base support structure comprising first and second base side members having outer end portions that terminate generally about respective lower side portions of said raised floor portion and inner ends that terminate in spaced apart relationship about a generally central portion of said floor portion, said first and second base side members including means for positively engaging said raised floor portion when said base support structure is placed over said raised floor portion; accessory support means integrally formed with said base and extending generally upwardly from said base support structure for supporting a particular accessory above said raised floor portion, said accessory support means including a pair of laterally spaced apart upstanding side support members extending generally upwardly from respective inner end portions of said first and second base side members and cross member means extending between said side support members and generally above said space defined between the inner ends of said base side members; said accessory support means including releasable securing means for receiving and holding



interconnecting attaching means extending from said particular accessory whereby said accessory may be readily and quickly attached and detached from said support assembly wherein a vehicle operator may protect against theft of the particular accessory by detaching and removing the accessory from said support assembly when leaving the vehicle unattended; and adjustment means transversely extending between said pair of laterally spaced apart support members of said accessory support means for adjusting the span between said first and second base side members such that by actuating said adjustment means said first and second base side members can be opened and closed about said raised floor portion such that when in a closed position said first and second base support members engage said raised floor portion and are firmly held thereabout by said positive engaging means associated therewith.

4,061,259

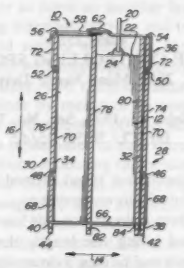
ADJUSTABLE CARRYING CASE SYSTEM

Billy L. Hurst, 1016 Marton St., Laurel, Md. 20810

Filed Sept. 29, 1976, Ser. No. 727,640

Int. Cl.[2] B65D *71/00*

U.S. Cl. 224—51 **8 Claims**



1. An adjustable carrying case system comprising:

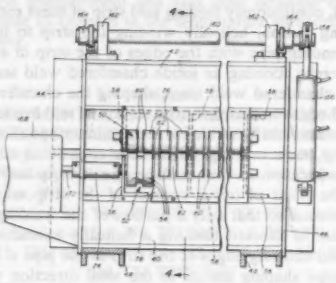
a. at least one case having a handle member affixed to an upper surface of said case;
b. at least a pair of transversely displaced opposing planar members being separate and distinct each from the other, said case being insertable between opposing internal surfaces of said planar members, said opposing planar members including (1) at least a first through passage aligned each to the other adjacent a lower surface of each of said planar members, (2) at least a second transversely directed through passage formed at a vertical intermediate location of said planar members, (3) at least a third through opening formed adjacent an upper surface of said planar members; and,
c. means for simultaneously releasably capturing and supporting said case between said opposing planar members and said capturing and supporting means, said capturing and supporting means passing through each of said passages and said opening.

4,061,260

BAG MAKING MACHINE

Robert M. Copp, 271 Thames St., Bristol, R.I. 02809

Filed Mar. 29, 1976, Ser. No. 671,263
Int. Cl.² B65H *17/26*
U.S. Cl. 226—139 **1 Claim**



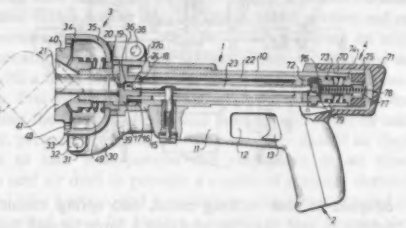
1. A feeding mechanism for advancing a web of thin, flexible sheet material, the feeding mechanism including a frame and a pair of feed rolls mounted to the frame for rotation about parallel axes, said mechanism comprising:
a plurality of thin walled, enlarged large diameter cylinders;
said cylinders being mounted coaxially and in spaced relation to each other;
a plurality of connective shaft segments extending between the adjacent ends of adjacent cylinders and to the outer ends of the outermost cylinders and being secured rigidly to said ends of said cylinders, said connective shaft segments being of relatively small diameter and being substantially shorter than their associated cylinders;
bearing means mounted to the frame to rotatably support each of the conductive shaft segments;
said feed rolls being mounted with respect to each other so that the outermost surfaces of the cylinders of one feed roll cooperate with the corresponding outermost surfaces of the cylinders on the other feed roll to define a nip line to grip and advance the web in response to rotation of one of said feed rolls;
a rotary fluid motor connected to the connective shaft of one of the rolls;
a pump;
a valve for controlling the rate of liquid flow from the pump to the motor;
a stepping motor for operating the valve; and
feedback means from the fluid motor to the valve and being response to termination of operation of the stepping motor to shut the valve and thereby stop the fluid motor.

4,061,261

DEVICE FOR PERFORMING WORKING OPERATIONS ON A WORKPIECE BY DETONATION OF BLASTING CHARGES

Rune Östen Walter Fredriksson; Johan Ingvar Johansson, both of Avesta, and Erhard Rudolf Boye, Gunnebobruk, all of Sweden, assignors to Avesta Jernverks Aktiebolag, Avesta, Sweden

Filed Nov. 25, 1974, Ser. No. 527,037
Claims priority, application Sweden, Nov. 28, 1973, 7316094
Int. Cl.² B23K *21/00*
U.S. Cl. 228—2.5 **18 Claims**



1. A hand-operated portable tool for carrying out working operations on a workpiece directly by blasting action produced by detonation of an explosive cartridge, comprising: a tool body; a front unit means, supported by said tool body, for engagement with the workpiece; and rear unit means supported by said tool body; said front unit means including means, movable towards said rear unit means into a retracted position against the action of a resilient means, for accommodating a prefabricated explosive cartridge in a position in which the front end of said cartridge is situated near the front end of said front unit means; said rear unit means including an igniting means for the explosive cartridge, said igniting means being releasable only in the retracted position of said front unit means; and said tool body including a first handle having first manually operable means for releasing said igniting means, a security means having an operative position in which to render said igniting means inoperative; and a second handle disposed a substantial distance forward of said first handle and near said front unit means and having second manually operable means for making said security means temporarily inoperative to render operative said igniting means.

4,061,262

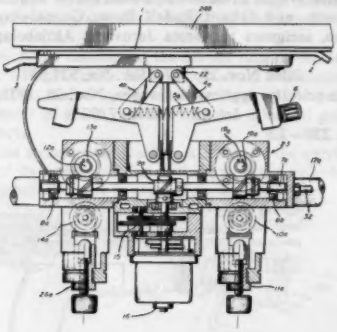
SELF-RUNNING ONE-SIDE WELDING FACILITIES

Hirokazu Nomura; Katsumi Tohno, and Tomio Takahashi, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1976, Ser. No. 678,256
Claims priority, application Japan, Apr. 22, 1975, 50-54118[U]; Apr. 22, 1975, 50-49531; Apr. 23, 1975, 50-56266[U]; Apr. 24, 1975, 50-95127[U]; July 10, 1975, 50-54119[U]
Int. Cl.² B23K *5/22*
U.S. Cl. 228—50 **9 Claims**

1. A self-running one-side welding facility for welding together butted edges of material to be welded, comprising:
at least two spaced guiding rails;
magnetic means for magnetically attaching said guiding rails to said material to be welded and for suspending said guiding rails from one side of said material to be welded in the vicinity of said butted edges;
a motor driven means including means for mounting a backing metal material against the butted edges to be welded, said motor driven means including means for suspending same from said guiding rails such that said backing metal mounting means is self-running along said guiding rails; and
means coupled to said guiding rails and motor driven means

for pushing said backing metal against the butted edges of the material to be welded, said pushing means comprising a link mechanism having a pair of pivotally mounted links



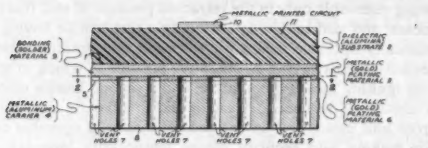
coupled to said backing metal, and spring means connected to said links for applying a force to said links for pushing said backing metal against said butted edges of the material to be welded.

4,061,263

METHOD OF BONDING A DIELECTRIC SUBSTRATE TO A METALLIC CARRIER IN A PRINTED CIRCUIT ASSEMBLY

Herbert Ohlstein, Elmwood Park, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 22, 1976, Ser. No. 725,204
Int. Cl.² B23K *31/02*
U.S. Cl. 228—124 **50 Claims**



1. A method of bonding a dielectric body to a metallic body comprising the steps of:

plating at least one surface of said dielectric body with a metal, said one surface to be bonded to a given surface of said metallic body;

forming a plurality of vent means in said given surface;

tinning said plated one surface and said given surface separately with solder;

cleaning said tinned plated one surface and said tinned given surface separately to clean both of said tinned surfaces;

applying a flux to both of said cleaned tinned surfaces separately;

placing both of said fluxed cleaned tinned surfaces in contact with each other;

applying heat and pressure simultaneously to both of said bodies until said solder of both of said fluxed cleaned tinned surfaces flows; and

cooling both of said bodies in a natural manner to room temperature while still applying said pressure to bond said dielectric body to said metallic body;

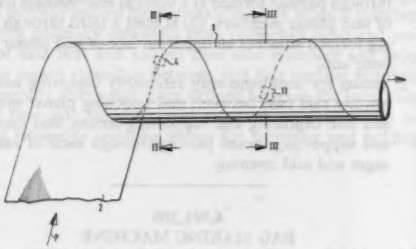
said plurality of vent means removing excess flux and solder during said step of applying heat and pressure to provide an intimate bonded contact between both of said surfaces and to prevent said solder from flowing onto undesirable areas.

4,061,264

METHOD FOR PRODUCING HELICAL SEAM PIPES

Werner Bartels, and Heinz Krakow, both of Hamburg, Germany, assignors to Blohm & Voss AG, Hamburg-Steinwerder, Germany

Filed May 4, 1976, Ser. No. 683,076
Claims priority, application Germany, May 9, 1975, 2520610
Int. Cl.² B21C *37/08*
U.S. Cl. 228—145 **2 Claims**



1. A method of producing welded helical seam pipe from a continuous strip of sheet metal, comprising the steps of chamfering the top and bottom surfaces of both edges of said strip of sheet metal, continuously feeding said strip of sheet metal to a pipe shaping station, helically winding the strip to form an axially extending pipe with the edges of the strip in abutting relation thereby forming an inside chamfered weld seam and an outside chamfered weld seam, shaping the chamfered surface of said edges so that the cross section of said inside chamfered weld seam can be welded at the maximum speed of travel of said strip, tack welding the outside chamfered edges together at a location in the winding of said strip into a pipe adjacent the point of initial contact of the strip edges into abutting relation so that only a portion of the welding of the outside seam is effected forming a helically extending joint between said abutting edges of the strip as the pipe is moving from the pipe shaping station in the axial direction thereof, finish welding the inside seam in said pipe forming station at a stationary location therein axially spaced from the location of said tack welding, severing the pipe having the tack welded outside chamfered seam and the finish welded inside chamfered seam, and thereafter finish welding the outside tack welded seam.

4,061,265

PRESSURE AND TEMPERATURE RESPONSIVE VALVE ASSEMBLY

Kazuhiko Kitamura, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed June 18, 1976, Ser. No. 697,645
Claims priority, application Japan, June 18, 1975, 50-74705
Int. Cl.² G05D *23/10*
U.S. Cl. 236—48 R **5 Claims**

1. A pressure and temperature responsive valve assembly comprising:

a housing;

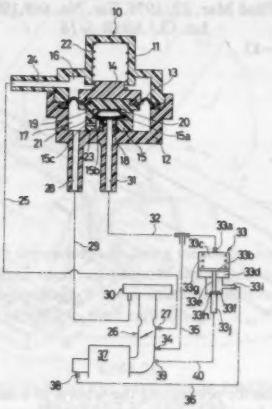
piston means movably disposed within said housing and dividing the housing into first and second compartments, first port means adapted to connect said first compartment with a first pressure source and second port means adapted to connect said second compartment with a second pressure source;

said piston means being movable between first and second positions due to the pressure difference established between said two compartments;

third port means adapted to connect said second compartment with a fluid actuated device, fluid communication between said second compartment and said fluid actuated

device being controlled by the movement of said piston means; and

bimetallic snap valve means carried by said piston means and



operable for controlling the communication between said second compartment and said fluid actuated device in response to changes in the temperature surrounding said housing.

4,061,266

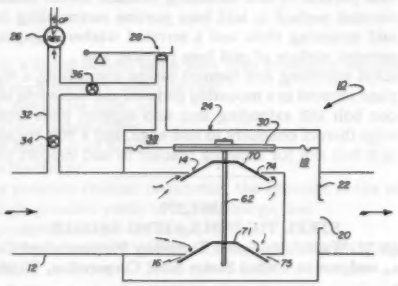
ENVIRONMENTAL AIR DISTRIBUTION CONTROL SYSTEM POWERED BY SYSTEM PRESSURE

Ralph M. Ley, Jr.; Harold W. Alyea, and Thomas M. Holloway, all of Waukesha, Wis., assignors to Johnson Controls, Inc., Milwaukee, Wis.

Continuation of Ser. No. 387,702, Aug. 13, 1973, abandoned, which is a division of Ser. No. 201,006, Nov. 22, 1971, Pat. No. 3,779,275. This application Aug. 18, 1975, Ser. No. 605,525

Int. Cl.[2] F24F *7/04*

U.S. Cl. 236—49 **18 Claims**



1. In an environmental control system including an air distribution duct having variable flow rates due to system variables, pressure regulating means for controlling the flow rate through said air duct comprising a pressure chamber disposed within said air duct between an inlet portion and an outlet portion thereof, said pressure chamber having an inlet communicating with said inlet portion of said air duct and an outlet with a fixed orifice communicating with said outlet portion of said air duct for permitting air flow through said chamber to establish a pressure in said chamber, reference means responsive to air flow through said duct to provide a substantially constant reference pressure, first means responsive to said constant reference pressure and to air flow through the inlet of said chamber for regulating air flow into said chamber for maintaining the pressure in said chamber substantially constant at a value which is established by said reference pressure to thereby maintain a constant flow rate through said fixed orifice, said reference means including second means for selectively varying said reference pressure in direct response to changes in the environmental temperature to thereby establish correspondingly different constant pressures in said chamber, whereby the rate of flow through said orifice is regulated in proportion to changes in temperature.

18. In an environmental control system for supplying conditioned air to a controlled space over an air distribution duct having variable flow rates due to system variables, apparatus for controlling the flow rate of air to said conditioned space comprising flow regulating means including a pressure chamber located within said air duct between an inlet portion and an outlet portion thereof, said pressure chamber having an inlet communicating with said inlet portion of said air duct and an outlet with a fixed orifice for permitting air flow through said chamber, first means disposed in said inlet of said chamber for controlling the flow rate from said inlet to said outlet of said chamber, pressure regulating means connected to said air duct adjacent to said inlet portion and responsive to air flow through said air duct to provide a regulated pressure derived from said inlet portion, and condition sensing means located in said controlled space for sensing a condition of said space and operable to modify the regulated pressure as a function of changes in the sensed condition, said flow regulating means further including second means responsive to said regulated pressure and to a pressure provided in said chamber in response to air flow through said air duct and supplied to said second means in opposition with said regulated pressure for causing said first means to provide a constant flow rate through said fixed orifice at a given value, and to respond to a change in said regulated pressure as effected by said condition sensing means to cause said first means to provide a constant flow rate through said fixed orifice at a different value.

4,061,267

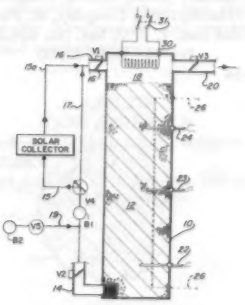
SOLAR HEATING SYSTEM AND OPERATION THEREOF

George O. G. Lof, 4850 Olive St., Denver, Colo. 80202

Filed Aug. 18, 1975, Ser. No. 605,672

Int. Cl.[2] F24J *3/02*

U.S. Cl. 237—1 A **14 Claims**



1. A heating system for a building comprising:

a. solar heat collector means for air heat transfer medium;

b. heat storage means including an elongated bed of solid particulate matter arranged for air passage therethrough and including a plenum chamber;

c. duct means for circulating air from said solar heat collector through said plenum chamber and then through said bed of particulate matter from one end in one direction for heating the same and from the opposite end in the opposite direction through said bed of particulate matter for heating air to be used to heat said building;

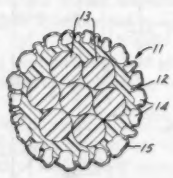
d. auxiliary heater means mounted in said plenum chamber for heating air passing therethrough;
e. means for moving air through said ducts and said bed of particulate matter;
f. temperature sensor means in said bed of particulate matter;
g. means for actuating said means for moving air through said ducts and said bed of particulate matter in response to said temperature sensor means;
h. control means for actuating said auxiliary heater means in response to said temperature sensor means and during a predetermined period corresponding to a low power load interval during a day so as to pass heated air to said heat storage means in the same direction as heated air from said solar heat collector;
i. temperature sensor means in said building; and
j. means for directing air through said bed of particulate matter so as to heat air directed into said building in response to a predetermined setting of said temperature sensor means in said building.

10. A method of operating a heating system for a building which includes a solar heat collector for supplying hot air to heat storage means including solid particulate material having a nominally hot end and a cool end and an auxiliary heater, and including temperature sensors in the building to be heated and temperature sensor means in the heat storage means spaced from end to end in the storage means which comprises:
a. passing air from the cool end of said storage means to said solar heat collector during times of effective solar radiation and then to the hot end of the collector;
b. passing air through the heat storage means with the exit air from the hot end of said storage means on demand of the temperature sensors in the building to be heated;
c. operating the auxiliary heater in response to need signals from the temperature sensor means in the storage means and during predetermined time periods as set by time determining means; and
d. circulating air through said storage means, during operations of said auxiliary heater, from hot to cool end thereof to store heat in said storage means supplied by said auxiliary heater.

4,061,268
TRACTION MAT

Robert D. DeMaster, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 1, 1975, Ser. No. 636,581
Int. Cl.[2] E01B *23/00*
U.S. Cl. 238—14 8 Claims

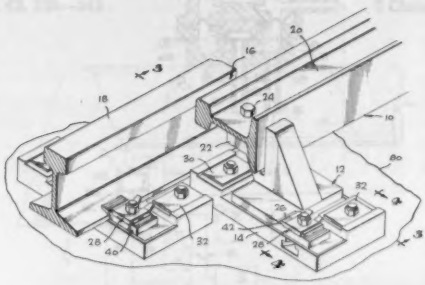


1. A flexible traction mat capable of being wound into a small-diameter storage roll around a 5-millimeter-diameter mandrel without damage comprising an open-mesh net of strands that are encased around their individual circumferences with a frictional coating that comprises a layer of flexible elastic binder material adhered to the strands and a dense monolayer of abrasive granules partially embedded in, and partially protruding out of, the binder material so as to frictionally engage a surface against which the mat is laid, the area of the openings in the mat averaging at least 50 square millimeters, whereby the mat may be repeatedly used between an icy street surface and the wheels of a vehicle to increase the traction of the wheels.

4,061,269
RESTRAINING RAIL MOUNTING ASSEMBLY

Richard M. Hixson, McLean, Va., assignor to Transit Products Company, Inc., Washington, D.C.

Filed Mar. 22, 1976, Ser. No. 669,109
Int. Cl.[2] E01B *5/18*
U.S. Cl. 238—17 1 Claim



1. Apparatus for preventing the wheels of a railroad train or the like from leaving a railroad track, said apparatus comprising:
a restraining rail mounted parallel to and spaced a constant distance from the railroad track and comprising at least one piece of railroad track mounted on its side so that the head portion of the piece of track presents a restraining surface adjacent the railroad track;
mounting means mounting said restraining rail said constant distance from the track, said mounting means comprising a mounting bracket comprising a base portion, a tongue portion having a mounting hole therein for fixedly securing the web of the piece of track to said bracket and means defining a slot in which a portion of one side of the base flange of said piece of track is received, said slot defining means including an abutment portion engaging the bottom side of the base flange of said piece of track;
adjusting means for adjusting the position of said mounting bracket comprising means defining mounting slots in said base portion of said mounting bracket, means defining a serrated surface in said base portion surrounding one of said mounting slots, and a serrated washer engaging the serrated surface of said base portion; and
bracket mounting and support means comprising a support plate secured in a mounting pedestal and including at least one bolt slot extending into said support plate from the edge thereof obliquely to said edge, and a bolt engaged in said bolt slot for securing bracket to said support plate.

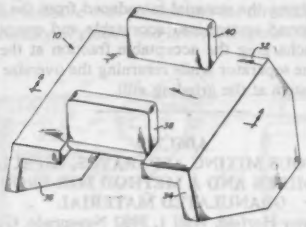
4,061,270
STEEL TIE INSULATING SADDLE

Joseph M. Wandrisco, Salem Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 9, 1976, Ser. No. 675,437
Int. Cl.[2] E01B *9/54*
U.S. Cl. 238—107 10 Claims

1. A unitized insulative element for use with a steel cross tie having associated rail retaining elements for preventing lateral movement of a rail on such steel tie and rail anchors for preventing longitudinal movement of such rail relative to such steel tie, said unitized insulative element comprising:
insulating base means adapted to be positioned between such rail and such steel tie for insulating the one from the other;
upwardly depending insulating detent means for insulating such rail retaining elements of such tie from such steel tie, said upwardly depending detent means being configured to provide means, relative to said base means and such associated rail retaining elements, for preventing movement of said unitized insulative element in a direction

parallel to such railroad rail and in a direction normal thereto; and



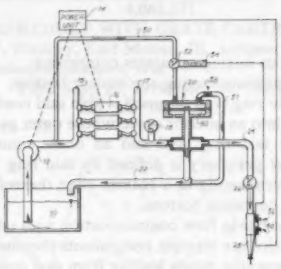
downwardly depending insulating means for insulating such steel tie from such rail anchors and additionally, for preventing movement of said unitized insulative element in a direction parallel to such railroad tie.

4,061,271

CONTROL SYSTEM FOR HIGH PRESSURE HYDRAULIC SYSTEM

Wade L. Kimbrough, P.O. Box 1467, Hobbs, N. Mex. 88240

Filed Oct. 13, 1976, Ser. No. 731,538
Int. Cl.² B05B *9/00*
U.S. Cl. 239—1 **19 Claims**



1. In a liquid system using very high pressures, including
a. a high pressure pump having
i. a pressure inlet, and
ii. a pressure outlet,
b. a reservoir of liquid,
c. a discharge,
d. a pressure conduit connecting the pressure outlet of the high pressure pump to the discharge, and
e. a control on the discharge;

THE IMPROVED SYSTEM COMPRISING IN COMBINATION:

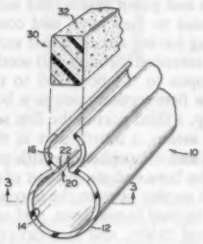
f. a feed pump having
i. a feed inlet, and
ii. a feed outlet,
g. the feed inlet connected to the reservoir of liquid,
h. the feed outlet connected to the pressure inlet,
j. a bypass conduit connecting the pressure outlet to the reservoir,
k. a pressure responsive valve including
i. a pressure valve at the entrance of the bypass conduit,
ii. a pressure responsive device for closing said pressure valve,
m. the high pressure pump outlet pressure urging the pressure valve located at the entrance to the bypass conduit to an open condition,
n. a normally closed control valve interconnecting the pressure responsive device to the feed outlet,
o. the pressure responsive device closing the pressure valve when pressurized, and
p. said control valve responsive to the control on the discharge.

4,061,272

IRRIGATION DEVICE

Emanuel A. Winston, 871 Marion Ave., Highland Park, Ill. 60035

Continuation-in-part of Ser. No. 588,900, June 20, 1975, abandoned. This application Dec. 18, 1975, Ser. No. 641,739
Int. Cl.² A01G *27/00*; B05B *15/00*
U.S. Cl. 239—145 **13 Claims**



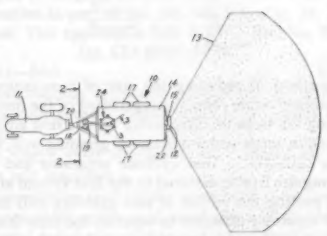
1. An irrigation device of the type primarily designed to deliver liquid along a predetermined path, said device comprising: conduit means including a substantially elongated configuration, said conduit means comprising at least a first compartment and a second compartment closely adjacent to and parallel to said first compartment and connected in fluid communication with one another, said conduit means comprising a one piece wall of extruded material integrally formed and configured to define said first and second compartment, interconnecting means disposed in interconnecting fluid communication between said first and second compartments; dispersion means comprising an elongated resilient liquid permeable porous material dimensioned to be greater than second compartment and mounted therein, said a portion of said dispersion means being compressed to occupy all of said second compartment with the remaining portion of said dispersion means extending outwardly therefrom in fluid communication with the exterior of said conduit means.

4,061,273

TANK SPREADER

James L. Richardson, St. Paul, Minn., assignor to Veda, Inc., Long Lake, Minn.

Filed Aug. 23, 1974, Ser. No. 500,133
Int. Cl.² B05B *1/20*
U.S. Cl. 239—172 **4 Claims**



1. A liquid manure spreader comprising: a tank having a chamber for storing liquid manure, means having an opening in communication with the chamber, a cover closing said open-

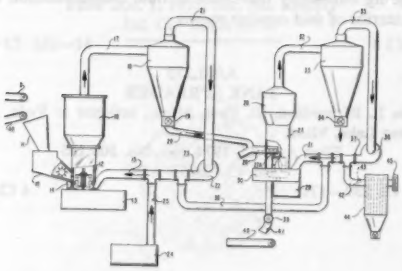
ing, pump means for selectively evacuating air from the chamber and supplying air under pressure to the chamber, control valve means for selectively controlling the movement of air to and from the chamber, air line means connected to the cover and valve means providing an air connection between the valve means and the chamber, manure discharge means on the tak for spreading manure when air under pressure is applied to the chamber, manure inlet means allowing manure to move into the chamber when air is evacuated from the chamber, safety shut-off valve means located inside the chamber operable to prevent the evacuation of air from the tank through the air line means in response to the level of the manure in the chamber, said shut-off valve means including valving means movable to a closed position in response to the level of the manure in the chamber to prevent escape of liquid manure into the air line means and pump means, and means attaching the shut-off valve means to the cover, said control valve means including a housing having a bore, a first section and a second section, said bore extended through said sections, a first port in the first section open to the bore and to the atmosphere, a second port in the first section open to a bore and to the air intake of the pump, a third port in the first section open to the bore and air line means, a fourth port in the second section open to the bore and atmosphere, a fifth port in the second section open to the bore and air exhaust of the pump, a sixth port in the second section open to the bore and air line means, a spool rotatably located in said bore, said spool having a first cavity and a second cavity, said first cavity positionable in a first position in communication with the first and second ports and a second position in communication with the second and third ports, said second cavity positionable in communication with the fifth and sixth ports when the spool is in the first position whereby air under pressure is directed from the pump to the air line means, and positionable in communication with the fourth and fifth ports when the spool is in the second position whereby air is evacuated from the air line means by a pump.

4,061,274

MATERIAL REDUCING APPARATUS AND METHOD OF OPERATING THE SAME

Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

Filed July 26, 1976, Ser. No. 708,889
Int. Cl.² B02C *23/14*
U.S. Cl. 241—24 **6 Claims**



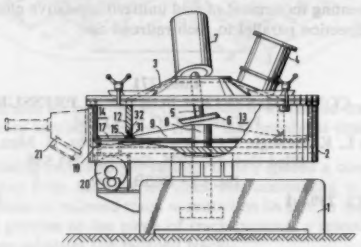
1. A method of reducing the size of a moisture carrying friable material while reducing regrinding of the finer fractions comprising the steps of: connecting up in a first air circulating system and in series order a material grinding mill, a fluid bed separator chamber, a first cyclone separator and a blower; introducing the friable material to the first system at the grinding mill, passing the output of said grinding mill through the fluid bed separator chamber to separate the finer fraction from the coarser and heavier fraction which returns to the grinding mill for further reduction, and discharging ground material from the first system at the cyclone separator while returning the air from the blower to the grinding mill; connecting up in a second air circulating system and in series order a material classifier, a second cyclone separator and a second blower; introducing to the second system at the material classifier the material discharged at the first cyclone separator from the first system; classifying the material introduced from the first system in the second system into acceptable and oversize fractions; and discharging the acceptable fraction at the second system cyclone separator while returning the oversize fraction to the first system at the grinding mill.

4,061,275

CONTINUOUS MIXING APPARATUS, ESPECIALLY COOLING MIXER AND A METHOD FOR PRODUCING GRANULATED MATERIAL

Friedrich Walter Herfeld, Wall 1, 5982 Neuenrade, Germany

Filed Sept. 3, 1976, Ser. No. 720,201
Int. Cl.² B02C *23/36*
U.S. Cl. 241—46.04 **12 Claims**



1. A continuous mixing apparatus comprising:
a. a mixing container having a container bottom;
b. a concentric ring wall disposed within said container and dividing it into an interior space whose outer periphery is defined by said ring wall and an outer annular space whose inner periphery is defined by said ring wall, said ring wall terminating in a bottom edge thereof disposed above said container bottom;
c. a feeding nozzle in flow communication with said interior space to introduce mixture components therein;
d. discharge opening means leading from said outer annular space;
e. a central agitator shaft supporting mixing wings for rotation within said interior space adjacent said container bottom;
f. a rotor ring carried by said mixing wings at a location radially spaced from said agitator shaft and disposed adjacent said bottom edge of said ring wall to define therewith a gap of selected width disposed above said container bottom and radially spaced from said shaft whereby mixture particles of a size not greater than said width of said gap are passed, by rotation of said wings, from said interior space to said outer annular space for removal therefrom via said discharge opening.

4,061,276

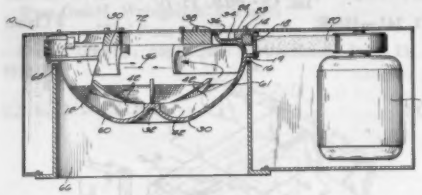
FRACTIONING AUTOGENOUS TRITURATOR

Paul J. Felker, 2200 Washington Ave., and Shubel H. Owen, Rte. 4, Box 238, both of Marshfield, Wis. 54449

Filed Jan. 17, 1977, Ser. No. 759,964
Int. Cl.² B02C *23/10*
U.S. Cl. 241—69 **6 Claims**

1. Material processing apparatus comprising a bowl having a bottom wall and an upwardly concave wall portion terminating in a bowl rim, a frame, means for rotatably supporting the bowl on said frame for rotation about a vertical axis, means in said bowl to impart rotational movement to materials contained in the bowl for travel upwardly along the concave wall, an inlet in said frame above said bowl bottom wall for intro-

ducing materials to be processed into said bowl, a plurality of deflector means located on said frame and within said bowl for intercepting material centrifugally elevated toward said bowl rim on said concave wall portion and for directing the materials in a plurality of guided and intersecting material streams to



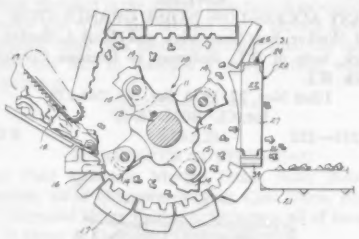
cause collision of the materials in the streams to triturate the particles, and foraminous outlet means in said bowl having openings sized to afford escape of fines of a pre-selected particle size as particles are reduced to said size during recirculation and repeated trituration.

4,061,277

SHREDDER WITH GRATE CARTRIDGE

Richard P. Whitney, East Moline, Ill., assignor to Sivyer Steel Corporation, Milwaukee, Wis.

Filed Sept. 20, 1976, Ser. No. 725,031
Int. Cl.² B02C *23/10*
U.S. Cl. 241—73 **6 Claims**



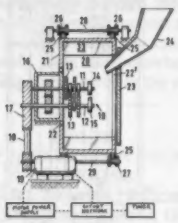
1. In a shredder of the type used to reduce scrap materials such as scrapped automobiles to pieces of a desired size, which shredder comprises a housing having a top, a bottom and side walls and an inlet and an outlet, rotary hammer means positioned in the interior of said housing, cutter means, means for rotating said hammer means to coact with the cutter means so as to reduce the scrap materials entering said housing via said inlet to pieces of a desired and a grate closing the outlet to pieces larger than the desired size, the improvement which comprises locating the outlet of the shredder in a side wall at a point approximately 180° from the inlet and closing said outlet with an improved grate which includes a frame having a top piece, a bottom piece and side pieces, a plurality of grate segments having top and bottom edges adapted to be received in the top piece and bottom piece of the frame, respectively, said segments being removably secured within said frame to form a unitary grate having openings through which pieces of the desired size can exit from the housing, and means removably securing the segments within the frame which means can be opened and closed from outside the shedder housing to permit the grate segments to be removed from the frame.

4,061,278

ARRANGEMENT FOR COMMINUTING AND/OR SHREDDING OF PAPER AND SYNTHETIC MATERIALS

Adolf Ehinger, Goethester, 10, 7460 Balingen, Germany

Filed Apr. 12, 1976, Ser. No. 675,998
Claims priority, application Germany, Apr. 12, 1975, 2516111
Int. Cl.² B02C *18/22*
U.S. Cl. 241—74 **4 Claims**



1. In a comminuting arrangement, a housing supported for rotation about a first axis and for pivotal movement about a second axis perpendicular to the first axis, first and second shafts disposed in the housing parallel to said first axis, at least the first shaft being supported for rotation about its axis, means comprising spaced discs affixed to the first and second shafts within the housing and intermeshing to form a nip therebetween for shredding material introduced into the nip from above when at least the first shaft is rotated, means for introducing material to be shredded into the housing, means disposed on the interior of the periphery of the housing for effecting movement so that the material in the housing moves jointly with the housing when the housing is rotated until said material is disposed above the nip of the shredding means, means for rotating the housing about the first axis, and means for rotating the first shaft about its own axis.

4,061,279

HIGH-SPEED ROTATING CRUSHING MACHINERY

Daniel C. Sautter, Kimberton, Pa., assignor to Pennsylvania Crusher Corporation, Broomall, Pa.

Continuation of Ser. No. 662,631, March 1, 1976, abandoned, Continuation-in-part of Ser. No. 501,551, Aug. 29, 1974, abandoned. This application Feb. 4, 1977, Ser. No. 765,720
Int. Cl.² B02C *23/00*
U.S. Cl. 241—86.1 **63 Claims**

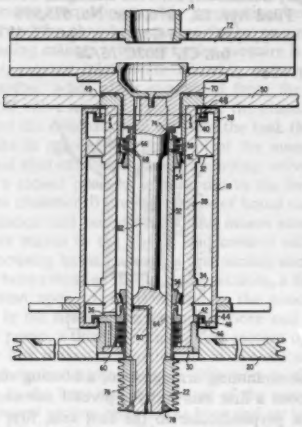
1. A drive shafting apparatus suitable for use in machines including a high speed rotating impeller or similar element, comprising:

an outer sleeve shaft adapted to be mounted for rotation within said machine;

an inner, cantilever shaft rigidly connected at one end of said cantilever shaft within said outer sleeve shaft and having substantial radial play within said sleeve shaft at the other end of said cantilever shaft, said other end of said cantilever shaft being adapted for connection to said high speed rotating element for rotation therewith; and

damper means situated about said other end of said cantile-

ver shaft for reducing radial vibrartion of said cantilever shaft as it rotates through critical speeds and for substantially eliminating whirling of said cantilever shaft and high speed rotating element.

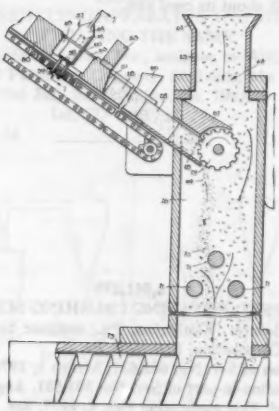


4,061,280

MIXING APPARATUS FOR FEED TO INJECTION MOLDING MACHINE

Theodor M. Box, 1108 Aileen Road, Brielle, N.J. 08730

Filed Oct. 29, 1976, Ser. No. 736,741
Int. Cl.² B02C *18/22*
U.S. Cl. 241—101.6 **4 Claims**



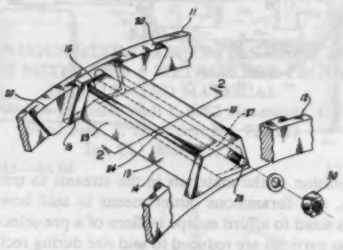
1. In an injection molding machine of the type for molding articles from particulate plastic material fed in measured amounts from a hopper to a reciprocally operated injection screw and having a color grinder associated with said hopper for introducing predetermined amounts of pigment to said plastic material, the improvement comprising variable speed means interconnected with said color grinder to control the amount of pigment relative to the amount of plastic material being fed to said injection screw, propulsion means associated with said color grinder for providing positive displacement feeding of said pigment to said color grinder, and safety release means on said pigment propulsion means for disengaging the latter means when said propulsion means moves near said grinder.

4,061,281

STRIKING PLATE FOR DISINTEGRATING MILL

Theodore F. Gundlach, Belleville, Ill., and Arthur L. Hawthorne, St. Clairsville, Ohio, assignors to J.M.J. Industries, Inc., Belleville, Ill.

Filed July 16, 1976, Ser. No. 705,795
Int. Cl.² B02C *13/10*
U.S. Cl. 241—188 R **8 Claims**



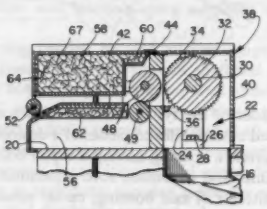
1. A striking plate for a disintegrating mill, comprising:
a. an elongate plate having a leading impact face with inner and outer edges, the leading impact face extending rearwardly from its inner edge toward its outer edge at substantially a constant angle for the major portion of its height, and extending relatively forward to its outer edge for a minor portion of its height, and
b. an integral flange at each end of the plate extending forwardly of the leading impact face, the flanges including outwardly converging, flow-directing side surfaces adjacent the leading impact face and extending from the inner to the outer edge.

4,061,282

EASY ACCESS-LOW NOISE GRANULATOR

William J. Walker, East Greenwich, and Henri A. Boulay, West Warwick, both of R.I., assignors to Leesona Corporation, Warwick, R.I.

Filed Nov. 22, 1976, Ser. No. 744,179
Int. Cl.² B02C *18/22*
U.S. Cl. 241—222 **8 Claims**



1. A granulator comprising a frame, a chamber, a rotor mounted for rotation about an axis within said chamber, feed means including a feed slot for introducing material into said chamber, said rotor including cutting means for contact with material fed to said chamber for size reduction thereof, a composite cover having first and second cover portions relatively movable with respect to each other and to said frame, said first cover portion at least partially enclosing said chamber, said second cover portion extending above said feed slot, said first cover portion connected to the frame along a vertical hinge line and said second cover portion in turn connected to the first cover portion along a horizontal hinge line whereby progressive opening of said second cover portion with respect to said first cover portion and then said first cover portion with respect to the frame along their respective hinges permits par-

tially and fully open granulator positions whereby said feed means and said chamber are sequentially exposed.

4,061,283

REFINER FOR GRINDING OF FIBROUS MATERIAL

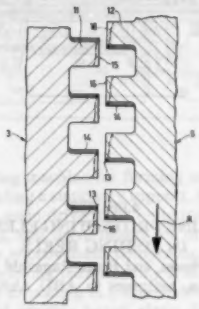
Albrecht Kahmann, Weingarten, Germany, assignor to Escher Wyss GmbH, Weingarten, Germany

Filed June 8, 1976, Ser. No. 693,918

Claims priority, application Switzerland, June 11, 1975, 7533/75

Int. Cl.² B02C *7/12*

U.S. Cl. 241—261.3 **2 Claims**



1. A refiner for grinding fibrous materials comprising

a stator having a plurality of rib-shaped teeth of substantially rectangular cross-section; and

a rotor having a plurality of rib-shaped teeth of substantially rectangular cross-section, said rotor being disposed in facing relation to said stator;

each said tooth of said stator and said rotor having a leading flank disposed in the mutual direction of movement of said stator and rotor, an end face and a surface layer on said leading flank of a hardness greater than the hardness of said end face to maintain a sharp cutting edge during operation.

4,061,284

HARVESTER CUTTERHEAD

Wesley Paul Raisbeck; Merlyn Duane Bass; Bobbie Dean Whicker, all of Ottumwa; William Clair Davis, Blakesburg, and Raymond Harry Fairbank, Ottumwa, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sept. 14, 1976, Ser. No. 723,036

Int. Cl.² B02C *18/18*

U.S. Cl. 241—294 **20 Claims**

1. A cylinder type cutterhead for a harvesting machine comprising: a rotatable, hollow drum having a generally cylindrical peripheral surface and axial shaft means; a plurality of knife support members mounted on the peripheral surface in a plurality of circumferential rows, each support member including a deflector surface on its leading side during normal cutterhead rotation and a relatively flat knife mounting surface trailing the deflector surface and inclined inwardly from its leading edge; a plurality of substantially flat knives respectively mounted on the knife mounting surfaces of the support members, each knife having an axial length substantially less than the axial length of the cutterhead and incluading a cutting edge along its leading edge generally parallel to the cutterhead axis, the ends of the knives mounted in one row of support members being axially proximate to the opposite ends of the knives in the adjacent row; and removable fastener means removably attaching each knife to its respective support member so that the knife cutting edges are disposed at the cutterhead periphery, substantially equidistant from the cutterhead axis, the knife cutting edges generating a cylinder as the cutterhead rotates.

4,061,285

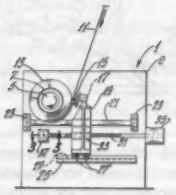
METHOD AND APPARATUS FOR PACKAGING LINEAR MATERIAL

Thomas V. Powers, Jr., Anderson, S.C., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 12, 1976, Ser. No. 685,591

Int. Cl.² B65H *54/02, 54/28*

U.S. Cl. 242—18 R **3 Claims**



1. Apparatus for packaging linear material comprising:

a rotatable collector onto which the linear material can be wound as a package;

a movable traverse guide for positioning the linear material on the collector;

a rotatable ball screw movably connected to the traverse guide;

a motor for rotating the ball screw to urge the traverse guide towards the package;

a clutch coupling having a rotatable first portion fixedly attached to the ball screw and a rotatable second portion adapted to be placed in engagement with the first portion to securely engage the second portion with the first portion;

fluid employing means for engaging the second portion of the clutch coupling with the first portion when the collector is rotating; and,

an overrunning clutch attached to the second portion of the clutch coupling, the overrunning clutch adapted to restrict the traverse guide from moving towards the package when the second portion of the clutch coupling is engaged with the first portion.

4,061,286

AUTOMATIC CASSETTE LOADER

James L. King, Sr., Sudbury; James L. King, Jr., Southboro, and William E. Cline, Braintree, all of Mass., assignors to King Instrument Corporation, Westboro, Mass.

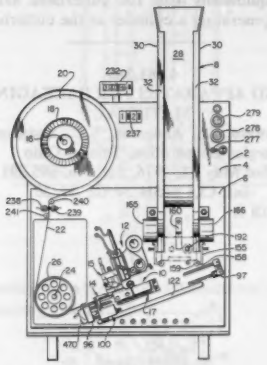
Filed June 14, 1976, Ser. No. 695,449

Int. Cl.² B65H *19/20*

U.S. Cl. 242—56 R **33 Claims**

1. In combination with a machine for loading a selected supply tape into a cassette which includes a tape leader, said machine having cassette holding means for holding the cassette to be loaded, a splicing block assembly for supporting the leading end of the supply tape and the leader of the cassette to be loaded, leader extractor means movable between said cas-

sette holding means and said splicing block assembly for withdrawing the leader from a cassette held by said cassette holding means and positioning the withdrawn leader on said splicing block assembly, means for operating said leader extractor means, multi-elememt means for sequentially (a) severing a leader that has been positioned on the splicing block assembly into first and second leader sections, (b) splicing said first leader section to the leading end of the supply tape, (c) winding the first leader section and a predetermined length of the supply tape which is connected thereto into the cassette held by the cassette holding means, (d) severing said supply tape at said splicing block assembly so as to form a trailing end for said



predetermined length of supply tape, and (e) splicing said trailing end to the second leader section, and means for causing said multi-element means to operate according to sequence (a) through (e) after a leader has been positioned on said splicing block assembly by said leader extractor means, the improvement comprising: leader centering means for acting upon a leader which has been extracted so as to cause the leader to shift lengthwise relative to the splicing block assembly to the extent required for the severing of the leader to be effected substantially at the midpoint of the leader, and means for operating said leader centering means before operation of said multi-element means.

4,061,287

PAPER-WINDING UNITS

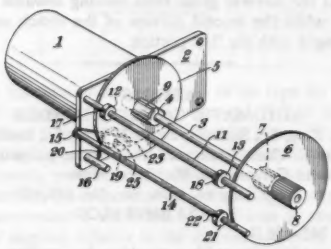
Keith James Shakespeare, Slough Place Farm, Cuckfield, Sussex, England

Filed Sept. 3, 1976, Ser. No. 720,449

Claims priority, application United Kingdom, Sept. 3, 1975, 36198/75

Int. Cl.² B65H *17/02, 59/00*

U.S. Cl. 242—67.1 R **6 Claims**



1. A paper-winding unit in, or for use in connection with, a teleprinter, comprising

a mounting plate;

an electric motor fixed to said mounting plate;

a shaft driven by said electric motor;

paper-receiving means carried by said shaft and having an end adjacent said mounting plate and a free end;

a paper guide rod fixed to said mounting plate and extending parallel to said shaft;

switch means for controlling said motor; and

a longitudinally extending operating member for controlling said switch means, said operating member having one end near said mounting plate and extending parallel to said guide rod;

and wherein the ends of said shaft, said guide rod and said operating member remote from said mounting plate are not separately supported.

4,061,288

RING-SHAPED LINE PROTECTING ELEMENT FOR USE IN FISHING REELS

Jarding Urban Karlsson, and Hugo Ragnvald Svensson, both of Svangsta, Sweden, assignors to ABU Aktiebolag, Svangsta, Sweden

Filed May 26, 1976, Ser. No. 690,062

Claims priority, application Sweden, May 27, 1975, 7506000

Int. Cl.² A01K *89/00*

U.S. Cl. 242—84.1 K **5 Claims**

1. A line protecting element for use in fishing reels with a line spool having circular end walls and with a surface surrounding at least one of said end walls of the line spool in spaced relation thereto,

said line protecting element comprising

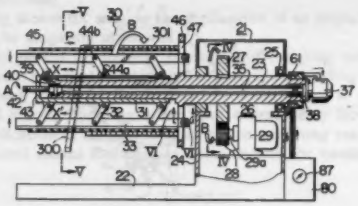
a split ring of elastic material, said ring being formed and dimensioned to be seated on the end wall of the end wall of the line spool and, in the seated position, to substantially close the space between the end wall and the surrounding surface, said elastic split ring being shaped to have, in a free condition of the ring, two facing, spaced apart ends where said ring is split and a spring rigidity which varies along said ring, and said split ring being formed to be non-circular in free condition and having, in said free condition, a maximum radius in the area of the split portion of said ring and a decreasing radius in both directions away from said area of maximum radius to a minimum radius in the zone opposite said area, and said ring being so shaped that, when bringing together said facing ends to a substantially closed annular form, in the form said ring is to have in position of use, it is generally circular and owing to its natural tendency to spring outwardly and its varying spring rigidity, adapts itself to said surrounding surface irrespective of minor non-circularity thereof.

4,061,289

WINDING MACHINE FOR ELECTRIC INDUCTIVE APPARATUS

Yoshio Miura; Kazuhiro Kobayashi, and Masao Kotera, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 5, 1976, Ser. No. 673,526
Claims priority, application Japan, Apr. 16, 1975, 50-45232
Int. Cl.[2] B65H *75/24;* H01F *41/06*
U.S. Cl. 242—7.13 **2 Claims**



1. In a winding machine for forming an electrical inductive apparatus including a stationary support, a bearing mounted on said support, a main drive shaft supported at one end thereof by said bearing, and drive means for drivingly rotating said drive shaft, the improvement comprising

a universal winding barrel having a slider mounted on said drive shaft for sliding in the axial direction of said shaft, a plurality of winding barrel plates disposed circumferentially around said shaft, a plurality of radially extending links pivotally connecting said slider to said plates, a rotating driving source mounted on the end of said drive shaft adjacent said bearing, a transmission rod extending through an axial bore in said drive shaft and beng connected at one end thereof to said rotating driving source so as to be rotated thereby, the other end of said transmission rod being in threaded engagement with the end of said slider so as to effect axial movement of said slider on said shaft as said transmission rod is rotated by said rotating driving source, and guide means for inhibiting axial movement of said plates while permitting radial movement thereof with respect to said drive shaft,

said rotating driving source including a hydraulic motor, hydraulic slip ring means for supplying and discharging hydraulic fluid to said hydraulic motor comprising an inner annular rotating portion mounted on said drive shaft and an outer fixed annular portion coupled to said inner portion and mounted on said support, first and second flow passages being formed in the mating surfaces between said rotating and fixed portions, a source of hydraulic pressure, and at least two pipes connected from one of said flow passages to said hydraulic source through said fixed portion and from the other of said flow passages to said hydraulic motor through said rotating portion, respectively.

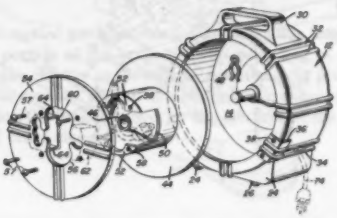
4,061,290

EXTENSION CORD REEL AND CASE

Thomas D. Harrill, Rte. 1, Mabank, Tex. 75147

Filed May 13, 1976, Ser. No. 686,671
Int. Cl.[2] B65H *75/40*
U.S. Cl. 242—96 **8 Claims**

4. An extension cord reel construction including a hollow body having opposite ends, one end of said body being open and the other end of said body including a closure end wall, a generally, centrally disposed stub shaft portion supported and projecting inwardly from said closure end wall toward the open end of said body, a wire spool including an elongated central core supporting fixed inner flange means at one end projecting radially outwardly from said core, said core defining a central journal portion opening axially outwardly of said one end of said core and journaled on said stub shaft portion with said flange means closely opposing the inner surface of said closure end wall, the other end of said core being hollow and including second radially outwardly projecting flange means supported therefrom substantially closing but rotatably received in said one end of said body and having a central opening therethrough opening into the hollow other end of said core, said body including one side wall portion having an opening formed therethrough for slidably receiving one end of an extension cord wound on said core therethrough, said core having an opening formed therethrough between said flange means opening into said hollow other end of said core for receiving the other end of said cord therethrough, whereby



said other cord end may be projected outwardly through said other end of said core and the central opening in said second flange means, a crank handle, means pivotally mounting said crank handle from said second flange means for movement between an inoperative position recessed inwardly of said central opening and an extended position projecting outwardly of said central opening and spaced radially outwardly of the axis of rotation of said core relative to said stub shaft portion, said second flange means including an inwardly projecting portion removably secured to said core for rotation therewith and from which said crank handle is pivotally supported.

4,061,291

VARIABLE TORQUE DRIVE

Douglas James Cunningham, Steep Marsh near Petersfield, England, assignor to Wingard Limited, Chichester, England

Filed Aug. 31, 1976, Ser. No. 719,316
Int. Cl.[2] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107 **14 Claims**

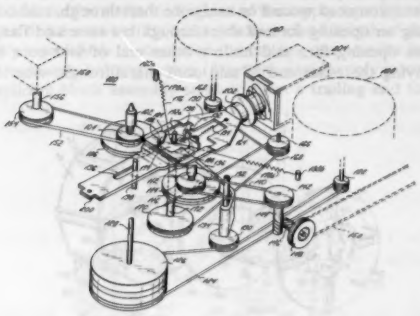
1. A safety belt reel comprising a coil spring, a shaft on which a safety belt is stored and a variable torque device coupling said spring to said shaft; said variable torque device including at least one spiral body, driven means coupled to said shaft and driveably engaged with said body, slotted support means, said spiral body being mounted for translational movement in said slotted support means, which translational movement takes place when said spring is wound or unwound by withdrawal and retraction of said belt, said translational movement causing a change in the radius of action of a couple acting between said spring and said shaft whereby the output torque of said device is varied to adjust the force exerted on said belt.

4,061,292

BI-DIRECTIONAL ROTARY DRIVE MECHANISM

James C. Whitney, Fairfield, Conn., assignor to Dictaphone Corporation, Rye, N.Y.

Filed Apr. 20, 1976, Ser. No. 678,704
Int. Cl.[2] G03B *1/04;* G11B *15/32*
U.S. Cl. 242—201 15 Claims



6. Apparatus for bi-directionally moving a web of material between first and second reels, comprising: a first spindle for driving said first reel in a first direction; a second spindle for driving said second reel in an opposite direction; a first rotary member on said first spindle having a rim adapted to be frictionally driven; a second rotary member on said second spindle having a rim adapted to be frictionally driven; drive roll means having a drive shaft and a peripheral surface for selectively contacting said rim of said first rotary member on said first spindle and said rim of said second rotary member on said second spindle; means for selectively bi-directionally driving said drive shaft, said bi-directional driving means comprising a bi-directional motor coupled to said drive shaft for rotating said drive shaft in one and opposite directions, respectively; a tensioned string member having an intermediate portion thereof deployed about said drive shaft, said drive shaft being displaced along said string member toward a first position in driving contact with said rim of said first rotary member on said first spindle when said drive shaft is rotated in said one direction and toward a second position in driving contact with said rim of said second rotary member on said second spindle when said drive shaft is rotated in said opposite direction thereby to drive said first spindle in one direction when said drive shaft is in said first position and to drive said second spindle in the opposite direction when said drive shaft is in said second position; a solenoid having an armature; a link member coupled to said armature and movable therewith; and stop means coupled to said link member and selectively disposable in the displacement path of said drive shaft to prevent said drive shaft, when said stop means is disposed in the displacement path of said drive shaft, from being displaced for said drive roll means to effectively drive said first and second spindles.

4,061,293

BALLOON WITH MANUALLY OPERABLE HELICOPTER BLADES

Kenneth K. Lo, Richmond, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 9, 1977, Ser. No. 775,709
Int. Cl.[2] B64B *1/32*
U.S. Cl. 244—26 2 Claims

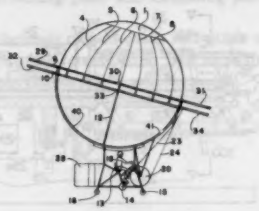
1. An aircraft, comprising

a balloon filled with buoyant gas for providing the major part of the required lift;

a pair of spaced rings at approximately the vertical center of the balloon supported by a rigging having a plurality of lines supported by the upper half of the balloon;

a pair of helicopter torque-balancing blade units each unit rotatably mounted on a corresponding one of the rings;

a frame capable of body movement between central and forward positions supported by the rigging beneath the balloon, said frame having a passenger's bicycle type seat mounted thereon, a pedal-operated sprocket wheel rotatably mounted thereon and a plurality of landing wheels rotatably mounted thereon;



coupling means coupling the sprocket wheel to the helicopter blade units in a manner whereby a passenger seated in the seat and pedalling the sprocket wheel in any position between the central and forward positions contrarotates said blade units for providing additional lift and forward propulsive force; and

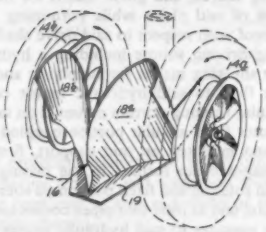
rudder means movably mounted on the frame and controlled in direction by the passenger for directing the craft in flight.

4,061,294

AIRCRAFT WHEEL ROTATOR

St. Elmo Hawkins, 107 Preston Road, Lynchburg, Va. 24502

Filed Jan. 21, 1977, Ser. No. 761,498
Int. Cl.[2] B64C *25/36*
U.S. Cl. 244—103 S 2 Claims



1. An aircraft wheel rotator for spinning up wheels having spokes prior to landing comprising: an air collector having an inwardly concave front edge with upper and lower terminal portions, said lower terminal portion connected to a rearwardly extending substantially flat plate, said air collector extending above and connected to said plate having a substantially conical configuration and having an open portion extending from the rearwardly disposed tip of the cone to said front edge so that air trapped between said flat plate and said air collector accelerates towards said tip of said cone and impinges upon the spokes of said wheel causing said wheel to spin up.

4,061,295

SHOCK ABSORBING METHOD AND APPARATUS

Paul T. Somm, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 22, 1975, Ser. No. 642,788
Int. Cl.[2] B64C *25/58*
U.S. Cl. 244—104 FP 7 Claims

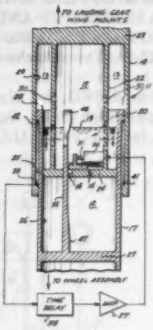
2. An apparatus for damping reactive displacement oscilla-

tions of a sprung mass in a system including a spring shock absorber interposed between the sprung mass and an unsprung mass, wherein such oscillations occur in response to an impact force applied to the unsprung mass and transmitted to the sprung mass through the spring shock absorber, comprising:

controllable damping means for providing a first damping mode having a first damping coefficient and for providing a second damping mode having a second damping coefficient that is substantially greater than said first damping coefficient;

sensing means for sensing the application of an impact force to the unsprung mass; and

control means for initially causing said damping means to assume said first damping mode and for responding to said sensing means for causing said damping means to assume said second damping mode after a time delay from said application of an impact force to the unsprung mass, said control means including a delay means for causing the



duration of said time delay to substantially equal the time interval required for the sprung mass to complete a first cycle of its reactive displacement oscillations.

6. In a method of absorbing the impact of a force, abruptly applied to a mass, by interposing a spring between the applied force and the mass such that the spring undergoes oscillatory displacement in reaction to the abruptly applied force and wherein the amplitude of such displacement decays with time, the improvement comprising:

sensing the application of said applied force;

initially damping the displacement of the spring with a damping coefficient that has a first predetermined value;

after a predetermined time delay from the step of sensing, damping the displacement of the spring with a damping coefficient that has a second predetermined value that is greater than the first value; and,

said time delay being substantially equal to the time interval that is defined by the time duration required for the spring to complete a first cycle of said oscillatory displacement.

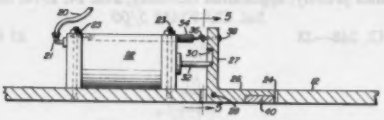
4,061,296

BRAKING SYSTEM FOR SKI OR FLOAT EQUIPPED AIRCRAFT

John Kubek, Newberg, Oreg., assignor to Andrew Kubek, Sr., Taylor, Mich., a part interest

Filed Dec. 18, 1975, Ser. No. 641,921
Int. Cl.[2] B64C *25/42*
U.S. Cl. 244—112 **6 Claims**

1. A braking system attachment for an aircraft equipped with landing gear structure comprising: means for landing on water in one of its various forms attached to the landing gear structure, a pivotally mounted brake member including a generally planar brake element, mounting structure means for attachment of said brake member to the landing gear structure, a hydraulic actuated slave cylinder mounted on said mounting structure, means for actuating the brake member from the slave cylinder, and non-hydraulic return means for the brake member to keep same in a non-actuated and non-braking position, the means for actuating the brake member from the slave cylinder including a pin connected directly to the piston of the slave cylinder and an elongated cam slot provided in the brake member for direct actuation by said pin, said cam slot comprising an elongated groove formed in and extending lengthwise of an arm portion of the brake member extending at generally right angles relative to the brake element and the pivot axis of said brake member, said pivot means including pivot pin means supporting the brake member at the juncture of the arm portion and brake element.

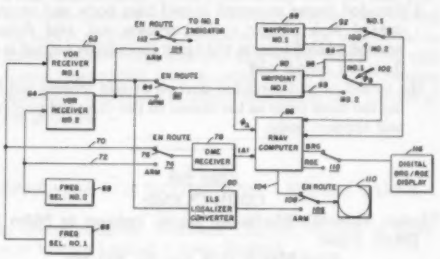


4,061,297

APPROACH RANGE MONITOR

George B. Foster, Worthington, Ohio, assignor to AirData Inc., Worthington, Ohio

Filed June 6, 1975, Ser. No. 584,407
Int. Cl.[2] G05D *1/12*
U.S. Cl. 244—184 **5 Claims**

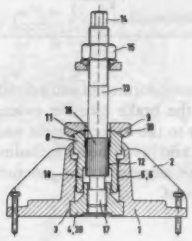


1. In an aircraft navigation system having first and second NAV receivers, at least one DME receiver, a localizer converter, a left-right steering display, and an RNAV computer, means to select reception of range and bearing to Waypoint information signals to a Waypoint station and means responsive to the range and bearing to Waypoint information signals to display said range and/or bearing of the aircraft to the selected Waypoint, the improvement comprising first switch means for selectively coupling said first or second receiver to the RNAV computer; means coupling said DME receiver to said RNAV computer; means coupling said first NAV receiver to said localizer converter; and second switch means simultaneously operable with said first switch means for selectively coupling the output of said RNAV computer or said localizer converter to said steering display, said first NAV receiver being coupled to said RNAV computer when said RNAV computer output is connected to said steering indicator and said second NAV receiver being connected to said RNAV computer when said localizer converter output is connected to said steering display, and wherein said range and bearing to Waypoint is displayed when said second NAV receiver is connected to said RNAV.

4,061,298
CENTRALLY ANCHORED ALIGNING DEVICE FOR MACHINES

Hubert Reinhard Kober, Leverkusen, Germany, assignor to Fixatorenbau Bertuch & Co. GmbH, Leverkusen, Germany

Filed Jan. 12, 1977, Ser. No. 758,644
Claims priority, application Germany, Jan. 14, 1976, 2601168
Int. Cl.² F16M *5/00*
U.S. Cl. 248—23 **23 Claims**



1. In an aligning device for machines of the type in which a threaded portion of a support body for supporting a machine pedestal is threadedly guided in a threaded portion of a base body anchored to or in the ground and is penetrated centrally through an internal bore therein by a tension rod, and the support body being arranged to be vertically adjusted also with the machine placed thereon, the improvement comprising:

entrainment means for interengaging said tension rod and said support body;

a threaded portion on said tension rod below said entrainment means;

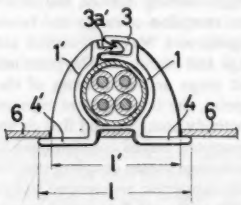
a threaded sleeve mounted in said base body and arranged coaxial with respect to said tension rod, said threaded portion on said tension rod being threadedly guided in said threaded sleeve; and

the thread of said threaded portion of said tension rod having the same pitch as the thread of the threaded portion of said support body.

4,061,299
CORD CLAMP

Mutsuo Kurosaki, Moriguchi, Japan, assignor to Nifco Inc., Tokyo, Japan

Filed May 3, 1976, Ser. No. 682,289
Claims priority, application Japan, May 6, 1975, 50-59732
Int. Cl.² F16L *3/08*
U.S. Cl. 248—73 **6 Claims**

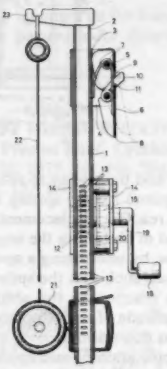


1. A one-piece plastic cord clamp, which comprises a pair of opposed, substantially rigid arcuate holding members, a hinge portion connecting the lower ends of said pair of holding members, said pair of holding members and said hinge portion being so disposed as to form a main clamp body, a pair of mutually engageable pawls formed one each at the upper ends of said pair of holding members, and a pair of leg members formed one each at the lower ends of said holding members and adapted to initially protrude outwardly therefrom in an angularly diverging relation so that said leg members converge about said hinge portion as a fulcrum when said engaging pawls are opened and the leg members flex about said fulcrum into a substantially co-planar, oppositely extending relationship when the engaging pawls are closed into fast mutual engagement, said pawls including a female portion at the upper end of one holding member and a male portion at the upper end of the other holding member, said female portion including laterally spaced hook means projecting into the mouth of said female portion and said male portion including oppositely facing laterally spaced shoulder means for engaging said hook means whereby said holding portions are positively locked by said male and female portions against both lateral and circumferential openings.

4,061,300
APPARATUS FOR STOPPING AND RELEASING THE MOVEMENT OF A SLIDING UP-AND-DOWN POLE OF A PORTABLE MOTION PICTURE SCREEN STAND

Sasuke Takahashi, 11-34, Yasunakacho-6-Chome, Yao, Osaka, Japan

Filed Jan. 3, 1977, Ser. No. 756,420
Claims priority, application Japan, Oct. 14, 1976, 51-123567
Int. Cl.² F16M *11/38*
U.S. Cl. 248—125 **1 Claim**



1. An apparatus for raising and lowering a windable portable motion picture screen comprising:

hollow support stand means for supporting said motion picture screen thereon, said support stand means having an opening at the top thereof;

support pole means positioned through said top hole of said support stand means and vertically movable therein for extending upward from said stand means and supporting said screen thereon when said screen is unwound;

lever means mounted on said hollow support stand means and engageable with said support pole means for locking said support pole means in position within said hollow stand means, said lever means comprised of:

a support surrounding said support stand means,

a lever member pivotally mounted on said support and engageable with said support pole means in said support stand means, said lever having an opening therethrough,

a hook member means pivotally mounted on said support and extending through said opening in said lever member and engageable with said lever member for locking said lever member away from said support pole means, and

spring means surrounding said first shaft and in contact with said lever for continuously biasing said lever toward said support pole means;

said support pole means has a geared rack portion on one side thereof; and

rotatable rack and pinion means attached to said support stand means and operatively engaging said geared rack of said support pole means for rotating and moving said support pole means upward and downward, said rack and pinion means comprised of:

support plates mounted on said support stand means,

a first shaft rotatably mounted through said support plates,

a first pinion connected concentrically with said first shaft and engageable with said geared rack portion of said support pole means,

an internal gear mounted concentrically with said first shaft and rotatable therewith,

a second shaft rotatably mounted through at least one of said support plates,

a second pinion connected concentrically with said second shaft and engaging said internal gear mounted on said first shaft, and

handle means connected to said second shaft for rotating said second shaft, whereby turning said handle means causes said second shaft and second pinion to rotate and in turn rotate said internal gear engaging said second pinion, thus rotating said first shaft connected to said internal gear and in turn rotating said first pinion engaging said geared rack portion of said support pole means, thereby moving said support pole means in said hollow support stand means.

4,061,301

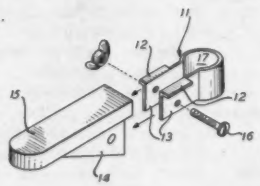
POLE INSERTER

Raymond Catena, Jr., 242 Highland Ave., Kearny, N.J. 07032

Filed Feb. 9, 1977, Ser. No. 766,889

Int. Cl.[2] A45F *3/44*

U.S. Cl. 248—156 3 Claims



1. A pole inserter comprising:

a. an elongated generally rectangular strap,

b. off-set edge portions at each end of the strap, disposed in general perpendicularity to the strap, and defining a support for a pedal,

c. the ends of the strap folded toward each other and disposed in spaced relationship to each other, with the off-set portions extending away from each other on the strap when so folded,

d. a brace positioned between the ends of the strap and having a generally flat vertical portion,

e. a flange on the top of the brace defining a pedal, and seated on the off-set portions of the strap,

f. a holding means passed through the brace and the strap to capture the brace and strap together when it is tightened,

g. a space defined between the strap and the flat vertical portion of the brace dimensioned to receive a pole in tight engagement when the holding means is tightened,

h. the end on the brace tightly engaged with the pole.

4,061,302

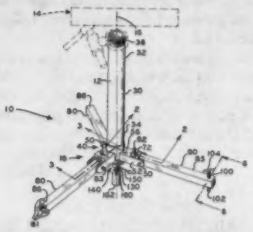
MOUNT

Terry Boone, 1343 N. Peach Ave., Fresno, Calif. 93727

Filed Nov. 5, 1976, Ser. No. 739,529

Int. Cl.[2] F16M *11/38*

U.S. Cl. 248—170 5 Claims



1. A mount for a load directed toward a support surface along a load axis extending substantially perpendicular to said surface, comprising:

A. a pedestal characterized by a centrally disposed load axis, a mounting portion adapted to receive an instrument package, and a base portion adapted to be disposed in juxtaposition with a support surface;

B. a plurality of uniformly spaced stabilizing legs pivotally connected to the base portion of the pedestal and extending radially therefrom for engaging the support surface; and

C. a load transfer member mounted on the base portion of the pedestal and extended coaxially therefrom for bearing against the support surface comprising a foot for engaging the support surface, means for interconnecting the foot in a load transferring, spatial relationship with the base portion of the pedestal including clamping means for securing the legs in a stabilizing position in which the legs extend in angular relation with said load axis, means for varying said spatial relationship, and securing means for maintaining the foot in said spatial relationship with the base portion of the pedestal.

4,061,303

APPARATUS FOR RETRACTING A RETRACTABLE PROTRUSION

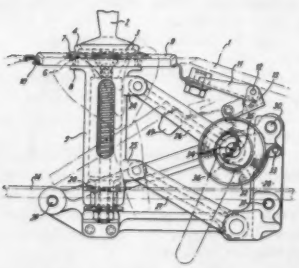
Bryan George Ridgway, Sandbach, England, assignor to Rolls-Royce Motors Limited, Crewe, England

Filed Oct. 28, 1976, Ser. No. 736,500

Claims priority, application United Kingdom, Nov. 8, 1975, 46293/75

Int. Cl.[2] B60R *27/00*

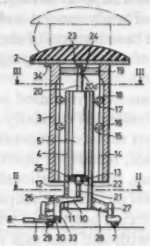
U.S. Cl. 248—204 15 Claims



1. An apparatus for retracting a retractable protrusion through an aperture in a housing at least partially into the housing from which it extends, said apparatus comprising:

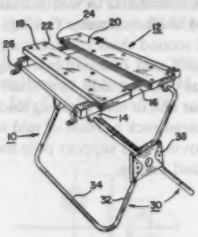
a base member fixedly connected to said housing;
a support member for said protrusion, said support member being pivotally connected to said base member;
first spring means urging said support member in one angular direction relative to said base member;
detent means operative to restrain movement of said support member in said one angular direction;
an actuating member operatively connected to said protrusion and mounted for movement relative to said support member; and
second spring means constrained between said support member and said actuating member, whereby movement of said actuating member relative to said support member against action of said second spring means causes release of said detent means to enable movement of said support member in said one angular direction.

4,061,304
SURGICAL CHAIR FOR A DOCTOR
Kurt Schattmaier, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland
Filed Aug. 25, 1976, Ser. No. 717,657
Claims priority, application Switzerland, Sept. 30, 1975, 12634/75
Int. Cl.² F16M *11/00*
U.S. Cl. 248—404 **5 Claims**



1. In a surgical chair for a treating physician, comprising an infinitely elevationally adjustable seat, a support column at which there is secured the seat, a stand tube arranged within the support column, a base frame having rollers connected with the stand tube, a lifting device arranged within the stand tube and operatively connected with the support column, a lever system for unblocking the lifting device, so that the seat, depending upon the load applied thereto, is elevationally adjustable, the improvement comprising:
a. the infinitely adjustable seat being non-rotatably mounted at the support column;
b. the base frame having a plurality of overhang arm members;
c. the lifting device having a plunger;
d. an angle lever pivotably mounted at the stand tube and acting upon said plunger;
e. a foot pedal having an upper edge;
f. means mounting the foot pedal with its upper edge at most 4 centimeters above the floor and symmetrically disposed between two overhang arm members of the base frame and with adjustable freedom of movement with respect to the floor;
g. a lever for connecting the foot pedal with the angle lever;
h. at least three guide grooves provided at the support column, said guide grooves being substantially uniformly distributed about the inner periphery of the support column and extending substantially parallel to the central axis of said support column;
i. at least three respective superimposed spaced rollers secured to the outer periphery of the stand tube and operatively associated with the guide grooves; and
j. said surgical chair, during its normal position of use, having said foot pedal between the legs of the user, said non-rotatable seat safeguarding against undesirable shifting of the body of the user relative to the foot pedal, to thereby ensure that said foot pedal is maintained between the legs of the user, and wherein the user can carry out elevational adjustment of the non-rotatable seat at such time that the buttocks of the user are located directly over the seat of the surgical chair and with both legs of the user supported on the floor and with one leg actuating the foot pedal by the heel portion of such actuating leg through the ankle joint thereof.

4,061,305
FOLDABLE, PORTABLE SUPPORT STAND
Gerald Beekenkamp, Etobicoke, Canada, assignor to The Black and Decker Manufacturing Company, Towson, Md.
Filed Oct. 4, 1976, Ser. No. 728,939
Int. Cl.² F16M *11/38*
U.S. Cl. 248—432 **17 Claims**

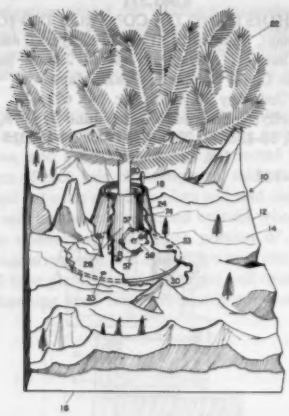


1. A foldable support stand comprising:
a pair of substantially rigid frames, each frame including a spaced apart pair of end legs and at least one longitudinally extending member, said end legs and said at least one longitudinally extending member being interconnected together to provide said frame with a predetermined configuration, said end legs of one said frame being in a cross-over relationship with the adjacent end legs of the other said frame, each of said end legs having a bight portion therein with the bight portions of the end legs of one of said frames being in mating relation with respective bight portions of the end legs of the other said frame to form first and second sets of mated bight portions and
first and second holding means corresponding to said first and second sets of mated bight portions, respectively, for embracing and clasping the mated bight portions together to maintain said mated bight portions in said mating relation and to conjointly define therewith a pivot joint permitting pivotal movement of said frames relative to one another between a folded position wherein said frames are in juxtaposition with one another and an open support position wherein said frames are angularly arranged relative to one another, and
limit means for defining the open support position of one said frame relative to the other.

4,061,306
DECORATION PLATFORM ASSEMBLY
Robert T. Taylor, 1693 Perrysville Ave., Pittsburgh, Pa. 15212
Filed Nov. 22, 1976, Ser. No. 743,709
Int. Cl.² A47G *33/12*
U.S. Cl. 248—523 **6 Claims**

1. An ornamental decoration platform assembly, comprising
base member means having an ornamental decoration on its upper surface and having its bottom surface constructed to stably rest on a flat surface;
socket means for receiving and securing a stem member, the outer surface of said socket means forming part of said upper surface of said base member;

said socket means including within its confines a tubular member guide means for positioning a stem member generally centrally of said tubular member, retractable and expandable locking means constructed and arranged to surround a stem member for engaging and locking it in fixed relationship with said tubular member; and



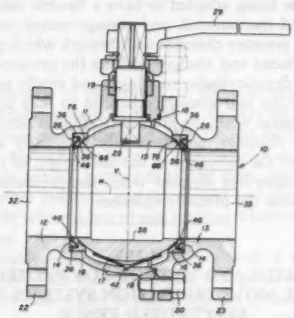
actuator means operative with said locking means for selectively actuating said locking means between locked and unlocked positions, said actuator means having at least a portion thereof disposed externally of said ornamental decoration and constructed and arranged for being operatively manipulated at a position above the surface of said ornamental decoration.

4,061,307

BALL VALVE

Kiwamu Yoshiike, and Hitoshi Yazaki, both of Tokyo, Japan, assignors to Kitazawa Shoji Kabushiki Kaisha, Japan

Filed Jan. 7, 1976, Ser. No. 647,003
Claims priority, application Japan, June 6, 1975, 50-68428
Int. Cl.[2] F16K *5/00*
U.S. Cl. 251—315 **1 Claim**



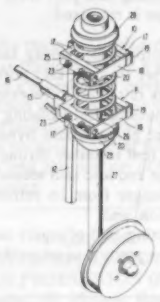
1. A ball valve comprising a plurality of outer casing elements adapted to form together an outer casing in which a movable valve body is accommodated, accommodation of said movable valve body in said outer casing being achieved by coupling said plurality of outer casing elements, a valve operating shaft journaled by said outer casing elements so as to rotate said movable valve body, an annular sealing member interposed between said movable valve body and outer casing elements to effect sealing and interception therebetween, and a resilient supporting member comprising a cone spring located on the inner bottom surface of said outer casing and having a concavo-conical surface embracingly engaging a convexospheric outer surface of said movable valve body so that said cone spring is burdened with the load of said movable valve body placed thereon and the surface along which said sealing member is in close contact with said movable valve body is free from influence by said load of the movable valve body, said cone spring also having an axis coincident with the rotary axis of said movable valve body, an apex received in a seat in said outer casing elements for providing substantially point contact therewith, and a plurality of slots extending from its outer periphery to associated apertures in said cone spring adjacent the center thereof.

4,061,308

SPRING MANIPULATING DEVICE

Roy B. Ghent, R.R. 1 Longacre, Marietta, Ohio 45750

Filed Dec. 30, 1976, Ser. No. 755,856
Int. Cl.[2] B23P *19/04*
U.S. Cl. 254—10.5 **7 Claims**



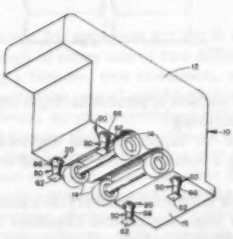
1. A spring manipulating device comprising a standard, a jack mechanism connected with the standard for movement relative to the standard, a first spring retaining frame fixed to the standard, and a second spring retaining frame fixed to the jack mechanism, each frame being of rectangular form and having one open side and each frame defining a channel passage around three sides thereof adapted to receive a spring coil, and a closure plate for the open side of each frame adapted to cover said open side and retain the spring coil engaged with the frame.

4,061,309

VEHICLE LEVELING SYSTEM AND DEVICE THEREFOR

Paul Edmond Hanser, Moline, Ill., assignor to HWH Corporation, Rock Island, Ill.

Filed Nov. 23, 1976, Ser. No. 744,240
Int. Cl. B66f *3/24*
U.S. Cl. 254—86 H **19 Claims**



1. A device for use in a system of leveling a trailer, camper,

truck or other similar vehicle relative to the terrain on which it is standing, said device comprising

A. a support assembly mounted on the lower portion of said vehicle for rotative movement thereon between an upper storage position and a lower operating position, said support assembly providing

i. a first power unit defining a first chamber from which a first plunger is axially extendable in one direction to rotate said assembly from its upper to its lower position and

ii. a second power unit fixed relative to said first power unit and defining a second chamber from which a second plunger is axially extendable in another direction to engage said terrain after said assembly has been rotated to its lower position,

B. means for sequentially extending said first plunger and then said second plunger, said extending means comprising

i. a port opening into said first chamber,

ii. a passage communicating between said first and second chambers,

iii. means for isolating said port from said passage when said first plunger is retracted,

iv. a power fluid,

v. means for selectively delivering said power fluid into said first chamber through said port to move said first plunger from its retracted to its extended position,

vi. means for bypassing said isolating means after extension of said first plunger, said bypass means diverting fluid from said first chamber through said first plunger and said passage and into said second chamber to move said second plunger from its retracted position to its extended position, and

C. means for retracting said plungers and rotating said assembly to its upper position upon rendering said extending means ineffective.

4,061,310

LIFTING CUSHION FOR THE LIFTING, SUPPORTING AND MOVING OF HEAVY OBJECTS

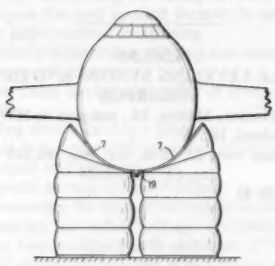
Manfred Vetter, Burg Langendorf, Zulpich-Langendorf, Germany (5351)

Filed Oct. 20, 1976, Ser. No. 734,156

Claims priority, application Germany, Oct. 20, 1975, 7533295

Int. Cl.[2] B66F *3/24*

U.S. Cl. 254—93 HP **14 Claims**



1. A lifting cushion apparatus having a top and bottom, said apparatus comprising:

a base plate for supporting said apparatus, said base plate including a bottom surface equipped with traction means thereon;

a plurality of inflatable chambers each located one above the other, at least one of said chambers comprising a first wedge chamber which will assume a wedge-like shape when inflated, said wedge chamber having a narrow end and a thick end;

at least two independent inflation valve means for independently inflating at least two of said chambers; and,

a flexible head plate attached to the top of said apparatus and adapted to mold itself to the contour of the surface of the object to be lifted.

4,061,311

AIR HOIST AND ITS CONTROL DEVICE

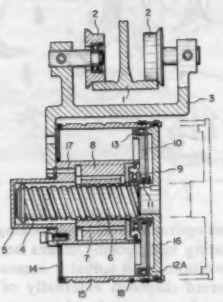
Akitosi Yamasaki, Takatsuki; Kiyoshi Fukuyama, and Kazunori Miyauchi, both of Neyagawa, all of Japan, assignors to Tsubakimoto Chain Company, Osaka, Japan

Filed May 28, 1976, Ser. No. 691,670

Claims priority, application Japan, June 2, 1975, 50-65279; Nov. 14, 1975, 50-136312; Nov. 14, 1975, 50-136313

Int. Cl.[2] B66D *1/08*

U.S. Cl. 254—168 **10 Claims**



1. An air hoist, comprising a nonrotatable support member having a ball-screw mechanism supported thereon, said ball-screw mechanism including a rotatable and axially movable screw coacting through balls with a nut fixed to the support member, a piston rotatably fitted on the support member and having a first fluid seal therebetween, means connecting the piston to the support member for preventing axial displacement of the piston, a drum-cylinder surrounding and axially slidably engaging the piston with a second fluid seal being disposed therebetween, the drum-cylinder being fixed to the screw and having an end wall which is axially spaced from the piston for forming a pressure chamber therebetween, the drum-cylinder being adapted to have a flexible cable-like element wrapped therearound, and passage means communicating with said pressure chamber and through which pressurized fluid is introduced and discharged from the pressure chamber, whereby the drum-cylinder rotatingly and axially advances by the action of the ball-screw mechanism to take up a flexible cable-like element when the pressurized fluid is introduced into the pressure chamber, and reversely rotatingly and axially retreats, under the influence of the self-weight of the load, to pay off the cable-like element when the pressurized fluid is discharged from the pressure chamber.

4,061,312

APPARATUS AND METHOD FOR PROTECTING WHEEL MOVE IRRIGATION SYSTEMS WITH ELECTRIFIED FENCE

Thomas S. Walchuk, Box 792, Ronan, Mont. 59864

Filed Oct. 20, 1976, Ser. No. 734,364

Int. Cl.[2] A01K *3/00*; A01G *25/09*; H01B *17/16*

U.S. Cl. 256—10 **8 Claims**

1. A protective system for wheel move irrigation systems which include an elongated conduit supported by, and extending through, the hubs of a plurality of ground-engaging sprinkler irrigation wheels, each of said wheels having a rim with a ground-engaging surface, comprising:

a. a plurality of insulators having support means thereon to releasably engage an electrified fence wire, at least one of

said insulators being releasably mounted on each of said sprinkler irrigation wheel rims; and

b. at least a single electrified fence wire extending along the length of said irrigation system, said wire being supported along its length by said support means.

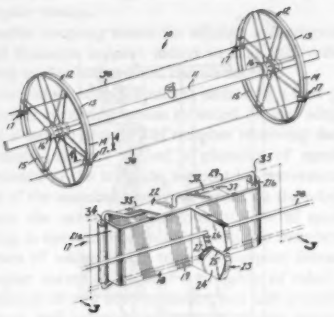
3. A clamp-on insulator comprising:

a. an elongated base plate adapted to be mounted on a sprinkler irrigation wheel rim having a ground-engaging surface and a spoke-engaging surface, said base plate having a face portion, and two opposite end portions;

b. electrified fence wire engaging means on said face portion;

c. over-center clamping means comprising two cooperative clamping arms, each said arm having outer and inner portions, and a buckle element connected to said inner portions of each said clamping arm, said wheel rim being disposed between said base plate and said clamping means when said insulator is mounted on said wheel rim; and

d. means connecting said outer portion of each of said clamping arms with said respective opposite end portions of said base plate, one of said inner and outer portions of said clamping arms being releasably connected.



8. The method of protecting the sprinkler pipes of a wheel move irrigation system, in which a plurality of said pipes are flexibly connected to form a single conduit supported by, and extending through, the hubs of a plurality of sprinkler irrigation wheels having ground-engaging rims, from damage by cattle or other livestock rubbing against said pipes when grazing in a field wherein one of said systems is located, comprising the steps of:

a. releasably mounting an insulator with a wire-engaging support means thereon on each said ground-engaging rim of each said wheel in said irrigation system on a side of said system from which direction cattle may approach, at such a height that, when a wire is strung along said system, engaging said support means, cattle or other livestock approaching said system come in contact with said wire;

b. stringing an electric fence wire along said system;

c. engaging said wire with said wire-engaging support means of each said insulator to support said wire along its length and restrain said wire from movement in relation to said system; and

d. energizing said supported fence wire.

4,061,313

APPARATUS FOR THE STATIC MIXING OF FLOWABLE SUBSTANCES

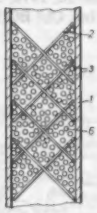
Dieter Brauner, Solingen-Wald; Hans-Joachim Kaluza, Cologne, and Edgar Muschelknautz, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 28, 1976, Ser. No. 700,645

Claims priority, application Germany, July 19, 1975, 2532355

Int. Cl.[2] B01F *15/02*

U.S. Cl. 366—340 5 Claims



1. An apparatus for the static mixing of flowable substances, comprising a tubular housing having a mixing insert arranged therein consisting of a plurality of intersecting plates disposed cross-wise and inclined with respect to the longitudinal axis of the housing, each of said plates having a plurality of alternating webs and slots and packing material filling in the free spaces between the plates and the portion of the mixing insert surrounded by the housing.

4,061,314

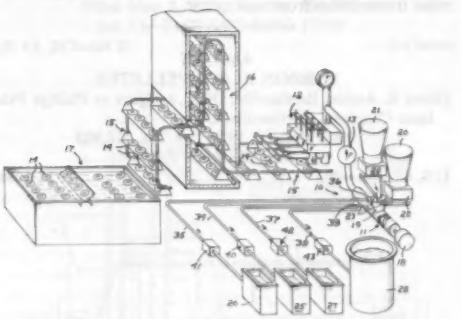
INPUT SECTION OF APPARATUS FOR USE IN THE CONTINUOUS PRODUCTION OF DOUGHNUTS

Richard W. Schmader, 50 Myopia Road, Winchester, Mass. 01890

Filed Dec. 27, 1976, Ser. No. 754,184

Int. Cl.[2] B01F *15/04;* A47J *37/12;* B67D *5/62*

U.S. Cl. 366—145 8 Claims



4. An input section for apparatus for use in the continuous production of dough of either one of two different types, said section including a blender, two containers, each for a dry ingredient for a particular one of said dough types and including a metering device, means to introduce either metered dry material into said blender, first and second oil containers, each for an oil appropriate for use with a particular one of said dry ingredients, a water container and a container for a yeast solution, thermostatically controlled means to refrigerate the water in said water container, thermostatically controlled means to refrigerate the yeast solution, outlet conduits, one for each container and including a metering pump, and said outlet conduits arranged in a manner such that both liquids for use

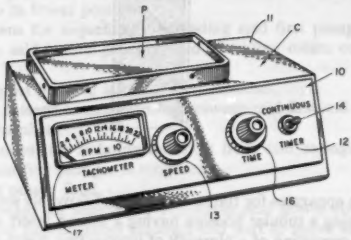
with each dry ingredient are in communication with the blender in the same relationship to the means by which the appropriate dry ingredient is introduced into the blender.

4,061,315

ORBITAL PLATFORM STIRRING SYSTEM

Vincent Elliott Eitzen, Evanston, and Robert Rockwell Moore, Glenview, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed June 16, 1976, Ser. No. 696,735
Int. Cl.[2] B01F *11/00*
U.S. Cl. 366—111 **17 Claims**



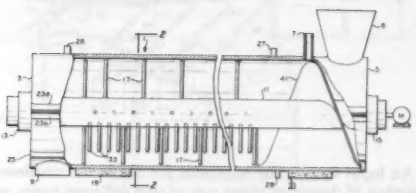
9. Stirring or vibrating apparatus comprising: a cabinet having a top panel; platform means on and above said cabinet for holding members; drive means, including a cam eccentrically connected beneath said platform for orbiting the same; bracket means within said cabinet; vibration-resistant mounting means for securing said bracket within said cabinet; a shaft; a drive motor mounted to said bracket means and coupled to said shaft to rotate the same; vibration-resistant coupler means for coupling said shaft to said cam, including a pair of laterally spaced resilient members connected to one of said shaft and cam and a channel shaped coupler straddling said resilient members and connected to the other of said shaft and cam whereby said cabinet and said platform are substantially free of noise transmission from said motor.

4,061,316

CARBON BLACK PELLETER

Oliver K. Austin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 16, 1976, Ser. No. 714,933
Int. Cl.[2] B01F *7/02*
U.S. Cl. 366—303 **11 Claims**



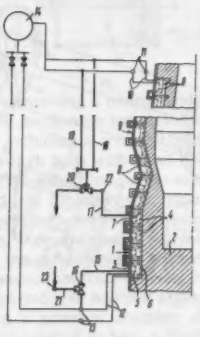
1. A carbon black pelleter comprising
a. a housing having an essentially cylindrically shaped internal surface,
b. a shaft coaxially and rotatably arranged within said housing,
c. a plurality of shaft pins attached to and extending essentially radially outwardly from said shaft,
d. a plurality of shell pins attached to and extending essentially radially inwardly from said housing,
with the further provision that
e. said shell pins are arranged in at least one row essentially parallel to the shaft axis,
f. all the shell pins are arranged in the lower half of the housing,
g. the shaft pins are arranged in such a pattern with respect to the shell pins that
aa. the shell pins do not touch the shaft pins during the rotation of the shaft,
bb. every shaft pin during one rotation of the shaft is at least once sandwiched between two shell pins,
cc. during the rotation of the shaft there occurs no more than about 1/6 of the total sandwiching of shaft pins between shell pins per shaft revolution at the same time.

4,061,317

BLAST FURNACE BOTTOM COOLING ARRANGEMENT

Sergei Mikhailovich Andoniev, prospekt Pravdy, 5, kv. 60; Boris Ruvimovich Granovsky, prospekt Lenina, 88, kv. 70; Leonid Davydovich Golod, prospekt Pravdy, 7, kv. 192; Gennady Alexandrovich Kudinov, prospekt Gagarina, 32, kv. 203; Grigory Ivanovich Kasyanov, prospekt Lenina, 64b, kv. 63; Oleg Vladimirovich Filipiev, prospekt Pravdy, 5, kv. 41b; Jury Ivanovich Tseluiko, prospekt Lenina, 17, kv. 55, and Evgeny Eliseevich Lysenko, Novgorodskaya ulitsa, 38/4, kv. 3, all of Kharkov, U.S.S.R.

Filed Feb. 23, 1977, Ser. No. 771,344
Int. Cl.[2] C21B *7/10*
U.S. Cl. 266—193 **7 Claims**



1. An arrangement for cooling the bottom portion of a blast furnace having a shell, which is lined with a refractory material and is divided into an upper and a bottom portion, plates, which are mounted in the furnace upper portion between the shell and the lining, and coil pipes incorporated in said plates and being situated in two vertical planes parallel to the furnace shell, comprising: plates mounted in said bottom portion of the furnace between the shell and lining thereof, said plates forming vertical and horizontal rows; coil plates situated in each of said plates in two vertical planes parallel to the furnace shell, there being at least two coil pipes in a first of said vertical planes and at least one coil pipe in a second of said vertical planes; said coil pipes in said first vertical plane of said plates mounted in the uppermost horizontal row being connected to said coil pipes of said plates situated in the upper portion of the furnace; cooling medium feed collectors of the furnace common cooling system controllably connected to said coil pipes provided in said plates mounted in the lowermost horizontal row; a high-pressure cooling medium collector controllably connected to said coil pipes in said second vertical plane of said plates mounted in the lowermost horizontal row; cooling medium return collectors of the furnace common cooling system controllably connected to said coil pipes in said first vertical plane of said plates mounted in the uppermost horizontal row and to said coil pipes provided in said plates in said furnace upper portion; and a high-pressure cooling medium receiver

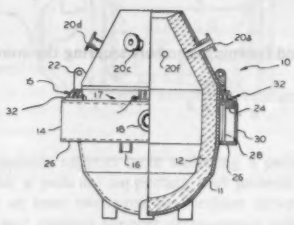
controllably connected to said coil pipes in said second vertical plane of said plates mounted in the uppermost horizontal row.

4,061,318

METALLURGICAL VESSEL

Howard M. Fisher, New Castle, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Aug. 5, 1976, Ser. No. 711,733
Int. Cl.[2] C21C *5/46*
U.S. Cl. 266—246 **19 Claims**



1. A refractory lined metallurgical vessel,
trunnion support means,
adapter means engageable with said trunnion support means,
a plurality of mounting means for affixing said vessel to said adapter means,
releasable coupling means for affixing said adapter means to said trunnion support means so that said vessel may be tilted to discharge metal therefrom, and
said releasable coupling means including a first plurality of member receiving means mounted on said adapter means and a second plurality of member receiving means on the trunnion support means, a plurality of members each mounted in the trunnion support for movement into and out of the member receiving means on the adapter means when the same are in alignment, one of said members being in operative orientation with one member receiving means of each of said trunnion support means and said adapter means in each of a plurality of relative angular positions of said adapter means and said trunnion support means, and releasable connector means associated with each of said members and being releasably engageable therewith to releasably secure said members in said aligned member receiving means,
said trunnion support means having hollow member receiving regions, said members being mounted in said trunnion support means for movement into and out of said member receiving means so that said members are movable out of said member receiving means and wholly into said trunnion support means whereby said vessel and adapter may be rotated about said second axis relative to said trunnion support means.

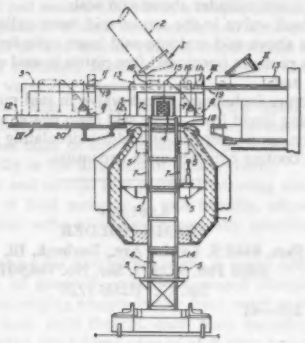
4,061,319

MOBILE TRUCK FOR RELINING A CONVERTER

Sadaharu Tanaka; Sadayuki Saito, and Sensaburo Hirano, all of Chiba, Japan, assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 27, 1976, Ser. No. 718,239
Claims priority, application Japan, Aug. 29, 1975, 50-118205[U]
Int. Cl.[2] C21C *5/44*
U.S. Cl. 266—281 **1 Claim**

1. In an organization for the pneumatic production of steel including a steelmaking converter having an upwardly opening mouth, a gas collecting hood over the mouth of said converter, means for removing at least the lowermost portion of said hood from its operative position over said converter mouth including a pair of rails straddling the converter mouth in superposed relation thereto, the improvement comprising:
a. a second pair of rails parallel to, but spaced below said mouth-straddling rails and extending to a position closely adjacent said converter;
b. a mobile truck including a frame of generally rectangular configuration;
c. said frame having wheels mounted thereon for engagement with both of said rail pairs;



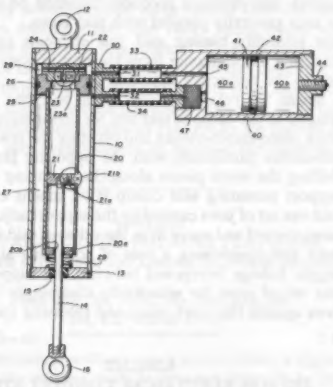
d. platform means carried by said truck;
e. winch means mounted on said truck and operatively connecting said platform means for raising and lowering the same to and from the interior of said converter when said truck is disposed in overlying relation to the mouth thereof; and
f. means for moving said truck into overlying relation to the mouth of said converter when said hood portion is removed therefrom.

4,061,320

TWO CYLINDER SHOCK ABSORBER SYSTEM

Joe Frank Warner, 504 Town Creek, Dallas, Tex. 75232

Filed May 3, 1976, Ser. No. 682,737
Int. Cl.[2] F16F *5/00*; B60G *15/08*
U.S. Cl. 267—64 R **3 Claims**



1. A shock absorber system comprising:
a. an outer cylinder having a top closure to be connected to a vehicle frame and a removable ported bottom closure;
b. a closed top inner cylinder slidably mounted coaxially in said outer cylinder and having a peripheral seal to the walls of said outer cylinder near the top thereof;
c. a spring between said inner cylinder and said bottom

closure to urge said inner cylinder toward said top closure;

d. a main piston in said inner cylinder having a piston rod extending down through said ported bottom closure in slidable fluid tight relation to be connected to a vehicle axle;

e. a cooling cylinder;

f. a flow line leading into said cooling cylinder from beneath said seal;

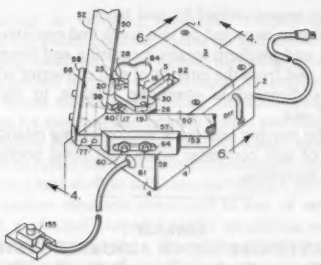
g. a return flow line leading from said cooling cylinder into said outer cylinder above said seal;

h. a check valve in the top of said inner cylinder for flow from above said seal into said inner cylinder;

i. a gas pressure positioned free piston in said cooling cylinder; and

j. structure including a check valve in said main piston for passing liquid from above said main piston to below main piston upon compression and for circulating fluid through said cooling cylinder upon expansion.

4,061,321
FRAME HOLDER
William Farr, 8445 S. Lawler Ave., Burbank, Ill. 60459
Filed Feb. 9, 1977, Ser. No. 766,901
Int. Cl.² B25B *1/20*
U.S. Cl. 269—41 **6 Claims**



1. A clamp comprising opposing relatively movable sets of jaws having opposing clamping faces, at least one set of jaws comprising:

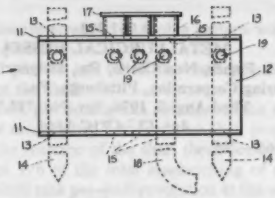
a support: jaw elements pivotally mounted on said support on axes generally parallel with said faces,

means yieldably biasing said jaw elements to a position disposing the clamping faces thereon in converging relation to the respective opposing faces,

and means for relatively advancing said one set of jaws relative to the other of said sets for clampingly engaging a work piece therebetween and pivoting the jaw elements to substantial parallelism with the opposing jaws and thus shifting the work pieces along the clamping faces, and a support mounting said clamp jaws, means connected to said one set of jaws carried by the support adjusting movement toward and away from the other of said sets of clamp jaws and comprising a pair of solenoids arranged in a toggle linkage interposed between the support and said one set of jaws for selectively clampingly locking said jaws against the work-piece and releasing the same.

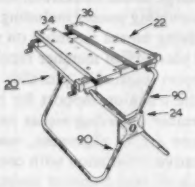
4,061,322
JIG FOR ELECTRICAL CONDUIT STUBS
Mervin G. Le Blanc, 2405 Fazzio Road, Chalmette, La. 70043
Filed June 10, 1976, Ser. No. 694,805
Int. Cl.² B25B *1/20*
U.S. Cl. 269—43 **5 Claims**

1. A conduit stubup jig comprising a channel shaped body, apertures adjacent the ends of said body in the flanges thereof, a plurality of spaced aligned apertures in the flanges of said body intermediate the ends thereof, stakes received in the first named apertures, conduit ends received in the second named apertures, fastening members securing the body of the jig to



the stakes, and fastening members securing the conduit ends to the jig.

4,061,323
WORKPIECE SUPPORTING AND CLAMPING APPARATUS
Gerald Beekenkamp, Etobicoke, Canada, assignor to The Black and Decker Manufacturing Company, Towson, Md.
Filed Mar. 9, 1976, Ser. No. 665,201
Int. Cl.² B25B *1/22*
U.S. Cl. 269—139 **24 Claims**



1. A workpiece supporting and clamping assembly comprising:

a generally rigid base frame including a spaced apart pair of elongated frame members;

a pair of elongated mutually adjacent top members mounted on said spaced frame members and disposed generally transversely thereto and each having upper work supporting surfaces lying generally in a common plane and longitudinally extending, opposed side portions defining clamping surfaces;

extensible and retractible clamping means interconnected between said base frame and one of said top members for moving the latter over said pair of frame members in a direction toward the other one of the top members to provide for clamping of a workpiece between said top members or for moving said one of said top members over said pair of frame members in a direction away from said other one of the members to provide for tensioning a workpiece between said top members;

indexing means formed on said frame members for indexing said other top member along said elongated frame members to any one of a plurality of selected positions whereby said top members can accommodate varying sizes of workpieces; and,

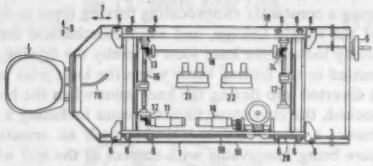
positive securing means for positively securing said other top member at any one of said plurality of selected positions irrespective of which of said directions said one top member is moved along said elongated frame members.

4,061,324

PATIENTS SUPPORT TABLE

Sverre Kvaerna, Farsta, and Sigvard Barud, Jarfalla, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 26, 1976, Ser. No. 661,514
Claims priority, application Germany, Mar. 3, 1975, 2509104
Int. Cl.[2] A61G *13/00*
U.S. Cl. 269—325 **3 Claims**



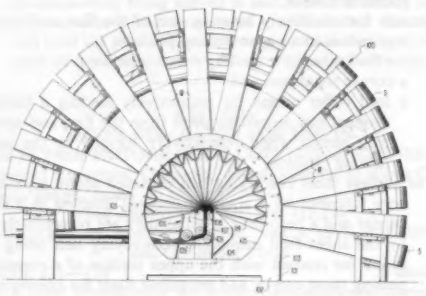
1. In a patients support table including a patients support arrangement; a pedestal supporting said patients support arrangement; at least two pressure medium drive motors for displacing said patients support arrangement relative to said pedestal in at least two directions; a pressure medium conduit for said motors; at least one controllable valve in said pressure medium conduit; and a control device receiving all of the control conduits of all said valves, said control device including manually actuatable control elements for said valves, said motors being compressed air motors, said motors for effecting the movement of said arrangement being located in an upper portion of the table, said upper table portion being removably connected with said pedestal; and coupling means being located between said upper table portion and said pedestal for releasing the compressed air flow between said pedestal and said upper table portion upon mounting of the latter on said pedestal and closing off the compressed air conduits of said pedestal upon removal of said table upper portion.

4,061,325

METHODS AND APPARATUS FOR INTERFOLDING ENDLESS PAPER WEBS

Nicholas Marcalus, and Jesse B. Smaw, both of One Market Street, East Paterson, N.J. 07407

Filed Aug. 19, 1976, Ser. No. 715,879
Int. Cl.[2] B41L *1/30*
U.S. Cl. 270—40 **4 Claims**



1. A machine for interfolding first and second bundles of interfolded paperous webs comprising:

a conveyor for advancing said first bundle forwardly;

means for advancing said second bundle forwardly in overlying relation relative to said first bundle;

a ramp for supporting said second bundle, said ramp being spaced above and converging forwardly downwardly toward said first bundle in superimposed relation therewith;

a first fold plate inclined upwardly and laterally inwardly relative to web movement from an edge of said first bundle where a fold line of the top web is located;

a second fold plate spaced from said first fold plate and inclined downwardly and laterally inwardly from an edge of said second bundle, diagonally opposite said first-mentioned edge, where a fold line of the bottom web is disposed;

said first and second fold plates arranged to guide the top web portion of said first bundle and the bottom web portion of said second bundle, respectively, in an unfolded condition as said first and second bundles converge vertically toward one another;

a terminal edge of said first fold plate being inclined downwardly in the direction of bundle travel and the terminal edge of said second fold plate being inclined inwardly in the direction of bundle travel;

said first and second fold plates terminating short of the point of final merging of said bundles, allowing said unfolded webs to assume a mutually interfolded posture.

2. In a machine for interfolding webs of paper comprising:

a plurality of generally radially arranged elongated fold plates converging longitudinally from outer ends thereof toward inner ends thereof, each plate including a web folding edge, the folding edge of each plate being situated at a side thereof opposite the folding edge of an adjacent plate,

a snub element spaced from the outer end of each folding edge, said snub element having a curved periphery defining a web discharge edge, said discharge edge being offset from the line of its associated folding edge in a direction toward a side of the plate opposite said folding edge so that an imaginary line between the outer ends of said folding edge and said discharge edge extends at an angle relative to said folding edge;

means for feeding a web of paper across the curved periphery of said snub element and along the folding edge of each plate so that said web is folded longitudinally in half along said folding edge,

means for overlapping one half of one web with one half of an adjacent web so that as said webs gradually converge along said converging plates, said adjacent webs become interfolded, and

a rotatably mounted guide roller spaced from the outer end of each folding edge, said roller being freely rotatable about an axis extending substantially perpendicular to the plane of the associated plate, said roller including a web-contacting periphery which is offset from said imaginary line so that the web is deflected from such imaginary line to a position nontangential relative to the curved periphery of said snub element to increase the tautness of the web.

4,061,326

APPARATUS FOR FOLDING FLATWORK

Donald Lewis Proudman, 215 Lincoln St., North Easton, Mass. 02356

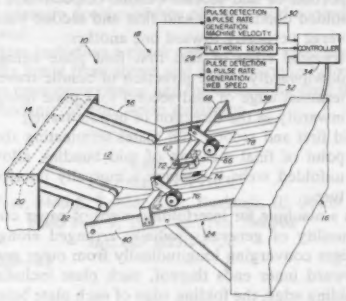
Filed Jan. 26, 1976, Ser. No. 652,395
Int. Cl.[2] B65H *45/00*
U.S. Cl. 270—69 **7 Claims**

1. In combination with an ironer and a folder, a digital control system for making folds at selected intervals in flatwork moving from said ironer to said folder, said folder including a folding mechanism that is responsive to said digital control system for making said folds, said digital control system comprising:

a. sensor means for detecting said moving flatwork and for generating a first signal indicating such detection, said sensor means located at a single location along the travel path of said web;

b. clock means for generating a first and a second series of clock pulses, said first series of clock pulses occurring at a basic rate, said second series of clock pulses occurring at a rate which is one third said basic rate;

c. controller means connected to said sensor means and said clock means, said controller means including at least first and second digital counter means for counting said clock pulses, said clock pulses occurring at said basic rate and said clock pulses occurring at said one third rate are applied to said second and first digital counter means, respectively; and


PULSE DETECTION & PULSE RATE GENERATION MACHINE VELOCITY
FLATWORK SENSOR
CONTROLLER
PULSE DETECTION & PULSE RATE GENERATION WEB SPEED

d. digital switch means connected to said first and second digital counter means for establishing a preset count of clock pulses in each said digital counter means, each said preset count representing a specific number of clock pulses, said first digital counter means generating a first fold signal when the number of clock pulses applied thereto is equal to said preset count established therein, said second digital counter means generating a second fold signal when the number of clock pulses applied thereto is equal to said preset count established therein, said first and second fold signals operative to actuate said folding mechanism for folding said flatwork at selected intervals.

4,061,327

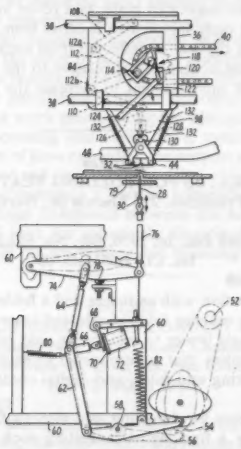
FOLDING APPARATUS

Hubert Blessing, 4431 Bobbitt Drive, Dallas, Tex. 75229

Filed Mar. 29, 1976, Ser. No. 671,625

Int. Cl.[2] B65H *45/00*

U.S. Cl. 270—78 **7 Claims**



1. Apparatus for folding a web-like work piece comprising a folding blade, means for actuating the folding blade to travel in a predetermined direction, means for positioning the work piece with respect to the blade in a plane non-parallel to the direction of blade travel and means for triggering the blade actuating means to cause the blade to impact with the work piece so as to fold it and then withdraw to its original position, and wherein the folding blade actuating means includes a two ended toggle linkage connected at one end in a driving relationship with the folding blade, the toggle linkage having a normally flexible knee joint between the two ends, means for supplying a constantly reciprocating driving force to the other end of the toggle linkage, and electromechanical means for selectively locking the knee joint whereby the driving force is transmitted to the folding blade when the knee joint is locked and is diverted into flexing the knee joint when the knee joint is unlocked, the electromechanical means including a stationary frame, a selectively energizable coil, an armature, the armature being immovable with respect to the coil when the coil is energized, and means for pivotally connecting the coil and the armature between the stationary frame and the knee joint to constrain the knee joint from flexing after the coil is energized.

4,061,328

PAPER FEEDER

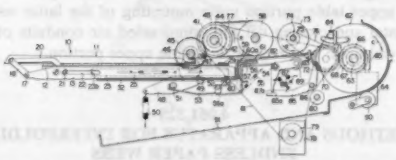
Sakae Fujimoto, Chofu; Takaji Sue, Kawasaki, and Toshihiko Misawa, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed June 15, 1976, Ser. No. 696,399

Claims priority, application Japan, June 25, 1975, 50-79648; June 25, 1975, 50-79647; June 19, 1975, 50-74773

Int. Cl.[2] B65H *3/44, 3/46*

U.S. Cl. 271—10 **10 Claims**



1. A sheet feeder comprising:

a first tray means for receiving a transmit original which is inserted inside a sheet carrier formed by a transparent sheet material;

a second tray means for receiving a plurality of recording sheets in a stack;

means for selectively locating one of the first and second tray means in a paper feeding position;

sheet feed means for feeding sheets including:

a corner separator; and

a feed roller means for respectively feeding a transmit original and recording sheet from the first and second tray means when respectively located in the paper feeding position;

an endless sheet conveying belt disposed above a passageway followed by a transmit original inserted in a sheet carrier and a recording sheet as they are respectively fed by the sheet feed means, the conveying belt being disposed for contact with the upper surface of a respective passing sheet carrier and recording sheet for conveying it to a processing station;

a frictional member disposed below the passageway and having a frictional surface gently pressed against the surface of the sheet conveying belt;

means for supporting the frictional member in a movable manner for movement in a direction normal to the surface of the sheet conveying belt; and

means for maintaining said frictional member and its frictional surface away from the sheet conveying belt when

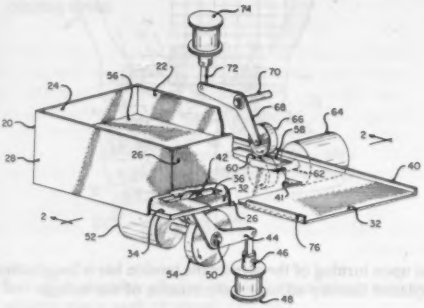
the first tray means is located in the paper feeding position.

4,061,329

OFFSET CARD FEED APPARATUS

Daniel B. Sachuk, Exton, and Robert L. Lane, Broomall, both of Pa., assignors to Computer Peripherals, Inc., Rochester, Mich.

Filed Nov. 26, 1976, Ser. No. 745,338
Int. Cl.[2] B65H *3/06, 5/06*
U.S. Cl. 271—10 **13 Claims**



1. An apparatus for feeding record cards from a card supply to a stationary position comprising:

a. drive means operating in a first direction;

b. feed means positioned adjacent a card in said card supply and engaging said drive means for operation in a second direction opposite to said first direction;

c. means supporting said feed means for movement into engagement with the card in the card supply when actuated, said feed means operated by said drive means in said second direction during said engaging movement to feed the enlarged card from the card supply to the stationary position;

d. and actuating means operatively associated with said support means to actuate said support means in said second direction to position the feed means in a card engaged position when enabled, said drive means moving the feed means in said first direction to a card disengaged position upon the disabling of said actuating means wherein said feed means will operate in said second direction while simultaneously being moved in said first direction by said drive means, which movement in said second direction will hold the card in the stationary position during movement of the feed means to the disengaged position.

4,061,330

SHEET SEPARATOR FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINES

Nobuyuki Yanagawa, Chigasaki, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

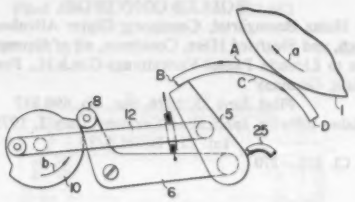
Filed Aug. 9, 1976, Ser. No. 712,714
Claims priority, application Japan, Aug. 9, 1975, 50-97025
Int. Cl.[2] B65H *29/54*
U.S. Cl. 271—174 **6 Claims**

1. A sheet separator for use in electrophotographic copying machines of the type comprising a rotating member for carrying copy sheets on the surface thereof, said separator comprising:

means disposed at a position adjacent the peripheral surface of said rotating member for separating a copy sheet from the surface when it is held attracted thereto, and having an air suction inlet formed in an end face which is located opposite the rotating member;

support shaft means for mounting said separating means for rotation between a first position in which the air suction inlet is located rearwardly, as viewed in the direction of rotation of the rotating member, of a line joining the axes of rotation of the rotating member, and the support shaft means, and a second position in which it is located forwardly of the line, said end face being located closest to the surface of the rotating member when aligned with the line;

air suction means communicating with the suction inlet for



drawing air therethrough at least during a movement thereof from the position aligned with said line to the second position;

drive means for moving the separating means from the first to the second position as the leading end of the copy sheet which is held attracted to the surface of the rotating member approaches said line; and

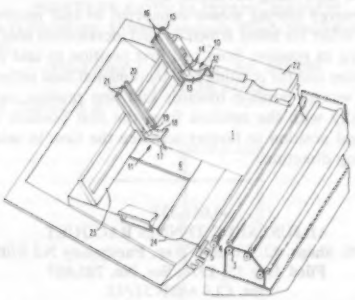
means for causing the velocity of movement of the end face of the separating means to exceed the peripheral speed of the rotating member.

4,061,331

DOCUMENT RECEIVING APPARATUS

Adolph Broadus Habich, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 7, 1976, Ser. No. 693,817
Int. Cl.[2] B65H *31/00, 31/20*
U.S. Cl. 271—223 **4 Claims**



1. An apparatus for receiving documents fed thereinto at a low velocity during an initial stage of a feeding cycle and at a high velocity during a final stage of said feeding cycle by spaced low and high velocity feeding means located adjacent said apparatus, said apparatus comprising:

a. platform means having a positionable receiving end for providing a base for receiving the leading edge of a document when fed thereonto at a low velocity during said initial stage; and

b. throat means for trapping said leading edge, and being located adjacent an end opposite said receiving end, and extending toward said receiving end a sufficient extent to

1. trap said leading edge prior to said document being fed at said high velocity, and

2. not restrict access for removal of documents from said

apparatus, said throat means including a number of wings, each comprising a side plate and an upswept top, and means supporting said wings for movement toward and away from said platform such that said wings are elevatable under the influence of said document when fed under said unswept top of said wings at said high velocity.

4,061,332

ROLLER CONVEYOR

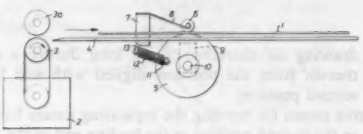
Karl Heinz Baumgärtel, Constance; Dieter Altenburg, Allensbach, and Siegfried Häse, Constance, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed June 23, 1976, Ser. No. 698,817

Claims priority, application Germany, July 1, 1975, 2529223

Int. Cl.[2] B65H *5/34*

U.S. Cl. 271—270 **5 Claims**



1. In a conveyor apparatus having at least one power-driven roller arrangement for a positive engagement and feed of an item in the conveying direction, the improvement comprising an incremental feed device situated downstream of said roller arrangement as viewed in the conveying direction, said incremental feed device including

a. an incremental feed roller spaced from said roller arrangement, each item being advanced into the zone of said incremental feed roller by said roller arrangement;

b. means for urging the item into frictional contact with the periphery of said incremental feed roller for rotating said incremental feed roller from a first position to a second position by said roller arrangement with the intermediary of the item being advanced; and

c. an energy storing means connected to said incremental feed roller for being armed by said incremental feed roller during its rotation from said first position to said second position and for rotating said incremental feed roller from said second position towards said first position codirectionally with the rotation from the first position to the second position to further advance the item in said conveying direction.

4,061,333

ADJUSTABLE TENNIS RACQUET

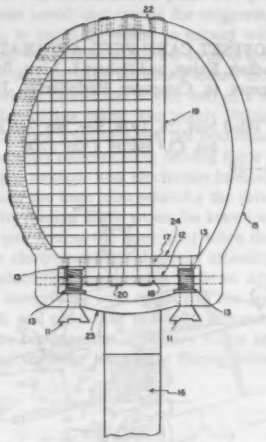
Spencer N. Shaps, 42 Winding Way, Parsippany NJ 07054

Filed July 15, 1976, Ser. No. 705,667

Int. Cl.[2] A63B *51/12*

U.S. Cl. 273—73 E **1 Claim**

1. A tennis racket with means for adjusting string tension comprising: a racket frame having a head portion carrying longitudinal and horizontal strings, a throat portion and a handle portion, a pair of spaced apart horizontal frame members located at the throat portion and fixedly attached to opposed sides of the frame, the frame sides and the pair of frame members forming an enclosed space, the tension adjusting means including a longitudinally moveable, horizontally extending tension bar located between the pair of frame members and within the enclosed space so that its horizontal movement in a plane perpendicular to the racket plane is restricted, the racket being strung so that the longitudinal strings extend freely through the upper frame member and then attached to the tension bar, a pair of screws threadedly engaging and extending through the tension bar and held in position by the pair of frame members, the screws having their manipulable ends extending outwardly from the lower frame member so



that upon turning of the screws the tension bar is longitudinally displaced thereby adjusting the tension of the strings.

4,061,334

DISC BOWLING GAME

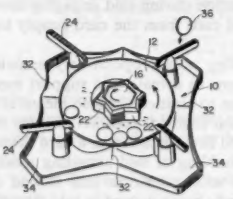
Hideyuki Kanno, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Mar. 12, 1976, Ser. No. 666,307

Claims priority, application Japan, Mar. 26, 1975, 50-10338[U]

Int. Cl.[2] A63B *65/12*

U.S. Cl. 273—126 A **8 Claims**



5. A game, comprising a base, a turntable, means mounting said turntable on said base for rotation in a substantially horizontal plane, a deflecting member, means mounting said deflecting member for rotation with respect to said turntable, at least one game piece, at least one chute mounted to said base extending downwardly to said turntable and adapted to permit said game piece to roll downwardly onto said turntable to be deflected by said deflecting member, and at least one compartment formed within said base outside and below said turntable for receiving said game piece after deflection by said deflection member.

4,061,335

BOARD GAME APPARATUS

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 30, 1976, Ser. No. 653,934

Int. Cl.[2] A63F *3/00*

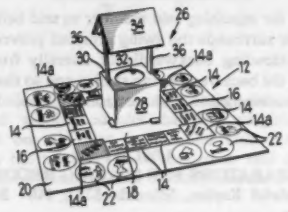
U.S. Cl. 273—134 AT **6 Claims**

1. A board game apparatus for a plurality of players, comprising, in combination:

a playing board, a relatively large playing area about the

periphery of the board, a course positioned interiorly of said large area defining a path of travel, said path of travel being divided into a plurality of stations, and including instruction stations having indicia thereon with reference to the playing rules which indicate a particular function to be performed by a player;

a plurality of sets of distinctive small playing areas within said relatively large playing area including means for distinguishing each said set of small playing areas from the remaining sets of small playing areas on the playing board, said distinguishing means comprising identifying stations on said path of travel, each of said identifying stations being associated with and adjacent one of said sets of small playing areas;



a first set of movable playing pieces for movement over said playing piece path of travel;

a second set of playing pieces having identical distinguishing means for defining a relationship to one set of small playing areas within a portion of said relatively large playing area, second identical means for indicating a relationship to one of the distinctive small playing areas within said related portion of said identified large playing area and means for concealing the same from the other players of the game;

a group of monetary tokens for payment of rewards to and penalties by players of the game; and

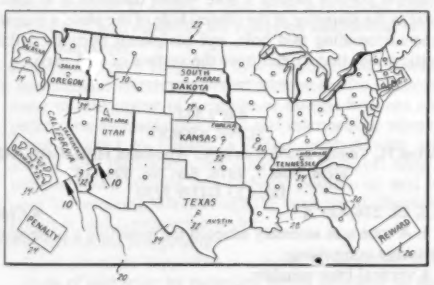
means for determining how many stations a particular movable playing piece is to be moved by a player along said path of travel defined by said stations.

4,061,336

GEOGRAPHIC BOARD GAME

Launa J. Lincoln, 10227 Meadowood, St. Louis, Mo. 63114

Filed May 14, 1976, Ser. No. 686,471
Int. Cl.² A63F *3/04*
U.S. Cl. 273—134 AC **8 Claims**



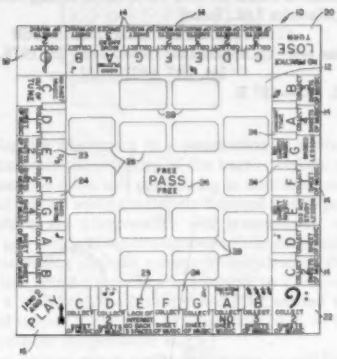
1. In a game, a playing surface having divisions thereon forming distinct geographical areas, cooperating pieces to be received on some of the areas of the playing surface, means for the playing surface to retain the cooperating pieces, means to select designated areas of the playing surface as beginning and goal locations, player travel mode tokens having different move characteristics represented by the appearance of the token, means for governing the conduct of the game between the beginning location and goal including means for selecting movement of the tokens on the playing surface between the beginning and goal locations.

4,061,337

BOARD GAME APPARATUS

William Boyd Callender, 723 Marks Road, Valley City, Ohio 44280

Filed June 25, 1976, Ser. No. 699,662
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 AT **15 Claims**



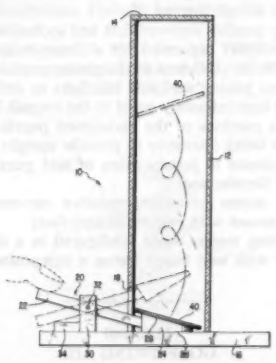
1. A game including a game board having spaces providing a path of movement for a game piece, instruction means for determining the extent of a player's movement of a game piece along said path, and first and second means associable by comparison by a player to determine whether the player gains access to said instruction means.

4,061,338

NOVELTY COIN FLIPPING DEVICE

Burton D. Goldberg, 15109 Watergate Road, Silver Spring, Md. 20904

Filed May 7, 1976, Ser. No. 684,259
Int. Cl.² A63B *67/12*
U.S. Cl. 273—138 R **6 Claims**



1. A novelty coin flipping device comprising:

an upstanding transparent tubular member having a substantially circular cross-section;

said tubular member having a cover member closing the upper end thereof;

a pivotal operating lever having a coin support pad thereon,

said coin support pad being disposed adjacent the bottom of said tubular member; and

a circular coin disposed in said tubular member, said coin normally resting upon said support pad;

said operating lever being digitally operable to flip said coin upward within said tubular member;

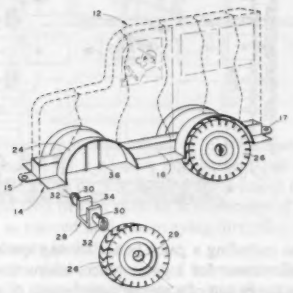
said coin, when flipped upward, rising within said tubular member and then gravitationally dropping therein to come to rest in either a "heads" or a "tails" position upon said support pad.

4,061,339

MOVABLE PUZZLE

Theo Maurice Simon Coster, Tel Baruch, Israel, assignor to Or Da Industries Ltd., Israel

Filed June 11, 1976, Ser. No. 694,958
Claims priority, application Israel, Sept. 25, 1975, 48178
Int. Cl.[2] A63F 9/12
U.S. Cl. 273—157 R **7 Claims**



1. A movable puzzle comprising:

a plurality of puzzle elements each having a top and a bottom portion and having a substantially planar configuration and length and height dimensions substantially greater than its thickness and together forming an image on at least one planar face of the top portion thereof when juxtaposed in a desired relative generally planar orientation;

means for mounting said puzzle pieces in upstanding orientation and in desired juxtaposition and spatial relationship so as to permit movement of the puzzle pieces as a whole, said means including:

an elongate trough formed of:

generally parallel disposed first and second side members spaced apart separated by a distance approximately equal to the thickness of the planar puzzle pieces; and

end pieces joining said side members to define a trough length approximately equal to the overall length of the bottom portions of the juxtaposed puzzle pieces, said trough being operative to provide upright support and maintenance in juxtaposition of said puzzle pieces inserted therein; and

translation means permitting relative movement of said support means with respect to a surface;

said mounting means being configured in a design which together with said image forms a composite representation.

4,061,340

GOLF SWING AID

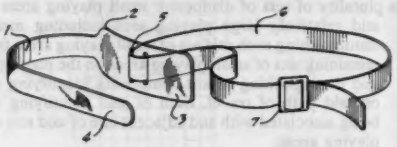
Allen Husted, 12865 Main St., Garden Grove, Calif. 92640

Filed July 13, 1976, Ser. No. 704,763
Int. Cl.[2] A63B 69/36
U.S. Cl. 273—189 R **4 Claims**

1. A golf aid device for controlling the position of the upper portion of the swing arm during a golf swing comprising:

a. A removable belt suited to surround the body of the golfer and which defines a generally horizontal plane about such body;

b. A generally rigid and horseshoe-type member which is adapted to fit about the portion of the golf swing arm above the elbow; and



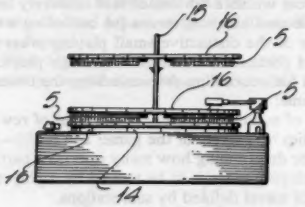
c. Means for attaching said member to said belt so that said member surrounds the swing arm and prevents such arm from extending backwardly or laterally from the body during the backward swing stroke; and so that such member is maintained in such horizontal plane.

4,061,341

SEPARATORS FOR SPACING RECORDS

Ricardo Gabriel Kaplan, Miranda 5237, 1407 Buenos Aires, Argentina

Filed Aug. 20, 1976, Ser. No. 716,328
Claims priority, application Argentina, Aug. 29, 1975, 260194
Int. Cl.[2] G11B 3/00
U.S. Cl. 274—1 R **7 Claims**



1. Separators for spacing records making up a stack of records, comprising a plurality of thin metal plates each provided with a central hole whose diameter is larger than the diameter of the central hole of the records and having a self-acting adhesive on one of its faces, said plates being adhesively attachable to at least one of the faces of each record in the central zone of the latter; and a plurality of parts constituted by a central portion having a hole whose diameter is at least as great as the diameter of the central hole of the plate, a magnetic zone surrounding said hole, and peripheral portions defining elastic zones that extend over the surface of said parts.

4,061,342

TONE ARMS

Steven H. Young, 23635 Tiara St., Woodland Hills, Calif. 91367

Filed June 7, 1976, Ser. No. 693,718
Int. Cl.[2] G11B 3/10
U.S. Cl. 274—23 A **8 Claims**

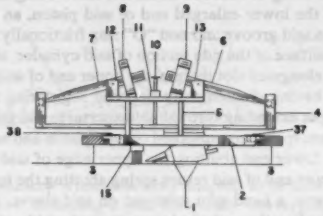
1. A tone arm assembly adapted for mounting a phonograph cartridge comprising:

a vertical base member;

an elongated horizontal support member rotatably mounted on said base and having an elongated opening formed therein and side tracks disposed on opposite sides of said opening; and

a carriage comprising a suspension support member mounted so as to move freely along said side tracks, a cartridge mount assembly adapted for mounting a phonograph cartridge, a first balance arm pivotably mounted on

one side of said suspension support member and coupled to one side of said cartridge mount assembly, a second balance arm pivotably mounted to the other side of said suspension support member and coupled to the other side of said cartridge mount assembly, whereby the cartridge



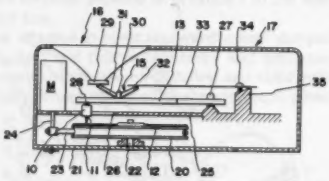
may be balanced by adjustment of said balance arms, and first and second counter balance weights slideably mounted on said first and second arms, respectively, whereby the tracking force applied to said cartridge is selectable by means of said counter balance weights.

4,061,343

VIBRATION TRANSMISSION MECHANISM FOR A PHONOGRAPH

Katsumi Watanabe, Kawasaki, Japan, assignor to Yugen Kaisha Watanabe Kenkyusho, Japan

Filed June 15, 1976, Ser. No. 696,113
Claims priority, application Japan, Mar. 11, 1975, 50-26566
Int. Cl.² G11B *3/00*
U.S. Cl. 274—24 R **4 Claims**



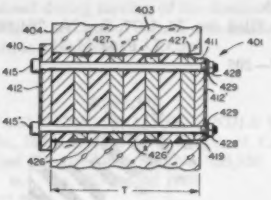
1. In a phonograph of the type comprising:
a casing;
a turntable rotatable with a record mounted thereon;
a pivotally mounted pickup arm carrying a reproducing stylus adapted to follow a groove in said record during rotation of said turntable for receiving mechanical vibrations therefrom;
a diaphragm rigidly supported by a portion of said casing;
an intermediate vibrator provided with means for mounting same to said casing in a cantilever fashion between said pickup arm and said diaphragm, said intermediate vibrator being adapted to remain in sliding contact with said pickup arm throughout the course of its travel from a predetermined starting to a terminal position on said record for receiving therethrough the mechanical vibrations set up in said reproducing stylus;
the improvement comprising:
a lever pivotally supported at a point intermediate both ends of said lever by mounting means provided on said intermediate vibrator, said lever having one end thereof disposed opposite to said diaphragm; and
means for applying a constant force to the other end of said lever for urging said one end thereof against said diaphragm, whereby the mechanical vibrations received by said intermediate vibrator are transmitted through said lever to said diaphragm to cause said diaphragm to produce corresponding sound waves.

4,061,344

FITTING FOR PENETRATION THROUGH FIRE RATED BARRIERS

Robert L. Bradley, Burlington, and Daniel J. Sullivan, New Britain, both of Conn., assignors to General Signal Corporation, Rochester, N.Y.

Filed June 23, 1976, Ser. No. 699,029
Int. Cl.² H02G *3/22*
U.S. Cl. 277—26 **14 Claims**



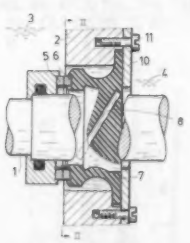
1. A fitting for placement in a penetration in a fire rated barrier to maintain the integrity of the barrier before, during and subsequent to a fire and comprising in combination:
a. first and second sealing materials disposed in said penetration which are compressible and intumescent, respectively, and which are in contiguous relationship; and with said first sealing material subject to dehydration, deterioration and volume reduction in response to a temperature above a threshold temperature and said second sealing material subject to the start of intumescence at, or below, said threshold temperature; and
b. pressure control means applying pressure to said first and second sealing materials for causing said first sealing material to seal said penetration against the passage of gases through said penetration from one side of said barrier to the other and for confining the initial volume into which said second sealing material expands when it intumesces; whereby any reduced volume of said first sealing material resulting from deterioration thereof in response to reaching said threshold temperature is filled by the intumescence of said second sealing material for maintaining the seal of said penetration against the passage of gases through said penetration from one side of said barrier to the other.

4,061,345

SEAL FOR A ROTATING SHAFT

Rolf Lund, Kauniainen, Finland, assignor to Oy E. Sarlin AB, Vantaa, Finland

Filed Apr. 29, 1977, Ser. No. 792,304
Claims priority, application Finland, May 3, 1976, 761235
Int. Cl.² F16J *15/34*
U.S. Cl. 277—88 **9 Claims**



1. Improvement in a seal for carrying a rotating shaft through a wall, comprising a rotating sealing ring and a stationary sealing ring abutting thereagainst, one of these two being connected with the shaft and the other with the wall and one of the two being located at the end of a rubber bellows produc-

ing an axial sealing pressure, wherein the improvement comprises that within the wall of the rubber bellows there is at least one metal pin, which is positioned obliquely with reference to the shaft.

4,061,346

CUP SEAL FOR USE IN A MASTER CYLINDER

John R. Coleman, Dayton, and Dwight W. McDaniel, Trotwood, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 24, 1977, Ser. No. 761,884
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—205 **3 Claims**

1. A cup seal for use on master cylinder pistons and the like, said seal comprising:

an annular body having an inner peripheral first seal lip in the free position extending axially and radially inwardly, a radially extending center portion from which said inner peripheral seal lip extends, and an outer peripheral seal second seal lip in the free position extending axially and radially outwardly from said center portion in the same axial direction as said first seal lip;

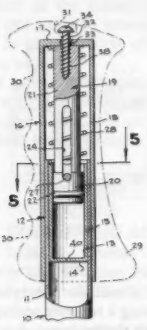
said second seal lip having an axial end defined by a surface, and an outer peripheral surface joined to said axial end surface at adjacent sides by a sharp lip edge, said lip being supported to extend axially by the lip material with said axial end of said lip extending axially away from said seal center portion, said axial end surface including a radially outer annular flat surface defined at its outer peripheral edge by said sharp lip edge and a substantially semi-circular cross section convex surface joining the inner peripheral edge of said annular flat surface and extending axially away from said seal center portion.

4,061,347

SHOCK-ABSORBING SKI POLE GRIP

Donald J. Stern, and Jon I. Allsop, both of Bellingham, Wash., assignors to Allsop Automatic Inc., Bellingham, Wash.

Filed June 1, 1976, Ser. No. 691,718
Int. Cl.[2] A63C *11/22*
U.S. Cl. 280—11.37 H **3 Claims**



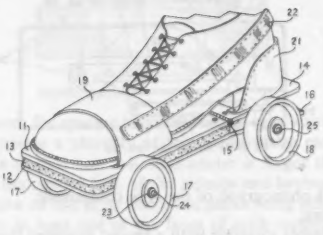
1. In a shock absorbing ski pole, a shaft, a cylinder mounted within the upper end of said shaft and said cylinder including a bottom portion and a cylindrical side portion, a sleeve movably mounted on said shaft, said sleeve including a top section and a cylindrical side section, a piston having a portion movably mounted in said cylinder, and said piston including a lower end of increased diameter and the remaining portion of said piston being of reduced diameter, there being an annular groove in the lower enlarged end of said piston, an "O" ring mounted in said groove and said "O" ring frictionally engaging the inner surface of the side section of said cylinder, said piston having an elongated slot therein, the upper end of said cylinder and shaft having diametrically opposed registering apertures therein, a pin extending through said apertures and though said slot, a return spring circumposed on said piston and said spring having its lower end abutting the upper edge of said cylinder, and the upper end of said return spring abutting the top portion of said sleeve, a hand grip mounted on said sleeve, a holding screw extending through the top portion of said hand grip and through the top portion of said sleeve and into engagement with the upper end of said piston, and a strap connected to said hand grip.

4,061,348

ROLLER SKATES

Lewis H. Carter, 969 Menlo Ave., Menlo Park, Calif. 94025

Filed Dec. 20, 1976, Ser. No. 752,412
Int. Cl.[2] A63C *17/14*
U.S. Cl. 280—11.21 **9 Claims**

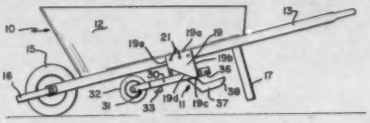


1. A roller skate comprising an upper foot-size plate having a front portion and a heel portion, a hinge pivotally interconnecting said front and heel portions, and further having means for strapping a foot onto the upper plate, a lower plate continuous with the upper plate, a compressible material disposed between the front portion of the upper plate and the corresponding portion of the lower plate and bonded to the upper and lower plates to hold the plates secure one atop the other, a pair of front wheels disposed on an axle secured to the undersurface of the lower plate, a pair of rear wheels disposed on an axle secured to the undersurface of the lower plate, a first braking disc secured to the wheel hub of each front wheel, a second braking disc slidably mounted on the front axle adjacent to the first braking disc, means for urging the first and second braking discs into braking relationship when the wheel goes in a backward direction but allowing forward motion of the wheels, a first rear braking disc secured to the hub of each rear wheel, a second rear braking disc slidably mounted on the axle adjacent the first disc, and lever actuated by downward heel pressure on the heel portion of the upper plate for moving the rear braking discs together, and spring means for disengaging the rear braking discs to allow forward motion of the skate.

4,061,349
AUXILIARY WHEEL ASSEMBLY

Roy Layton Stahl, 6838 Forest Crest North, San Antonio, Tex. 78240

Filed Dec. 13, 1976, Ser. No. 750,012
Int. Cl.[2] B62B *1/20*
U.S. Cl. 280—47.2 11 Claims



1. An auxiliary wheel assembly adapted to be mounted on a wheelbarrow including a pan, forwardly converging handles secured to said pan, a forward wheel rotatably mounted intermediate said handles, and legs supporting said pan, said assembly comprising

first and second outer plates adapted to be secured to selected portions of said handles,

first and second transversely extending and longitudinally spaced bars secured to selected portions of said handles,

first and second inner plates equidistantly spaced laterally of the longitudinal axis of said wheelbarrow and intermediate said first and second outer plates,

said inner plates secured to selected portions of said second bar,

at least first, second and third transversely extending rods passing through selected portions of said inner plates and secured laterally to said outer plates,

an elongated, longitudinally extending arm pivotally mounted intermediate said inner plates on said second rod,

an auxiliary wheel rotatably mounted on said arm,

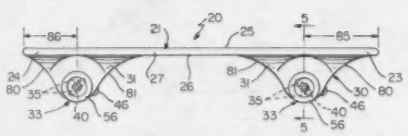
a shaped member secured in proximity to the rearmost end of said arm,

said arm adapted to pivot rearwardly until stopped by bearing against said first rod whereby said arm extends angularly upwardly between said first and third rods and said auxiliary wheel additionally supports said wheelbarrow.

4,061,350
SKATEBOARD

Ernest J. Schmidt, Jr.; Michael G. Rinehart, both of Kalamazoo, and Bascom D. Blevins, Portage, all of Mich., assignors to Dayco Corporation, Dayton, Ohio

Filed Sept. 1, 1976, Ser. No. 719,872
Int. Cl.[2] A63C *17/00*
U.S. Cl. 280—87.04 A 12 Claims

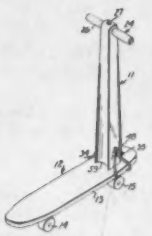


1. A skateboard having a longitudinal axis and comprising, a support member having a top support surface and a bottom surface, a pair of projections fixed to and extending from said member beneath said bottom surface, a pair of wheel assemblies each fastened to an associated projection, and fastening means for fastening each of said wheel assemblies to an associated projection with each fastening means being disposed entirely beneath said bottom surface and comprising means allowing resilient pivoting movements of its wheel assembly in a controlled manner for improved turning of said skateboard, each of said fastening means in each projection comprising an elongate slot extending transversely through its associated projection, said elongate slots being inclined in opposed directions, each of said slots being defined by a pair of spaced planar surfaces adjoined at opposite ends thereof by interconnecting surfaces, each of said wheel assemblies comprising an axle having a central portion provided with a cooperating surface which engages an associated planar surface of its projection, said associated planar surface engaging said cooperating surface holding the axle against rotation relative to its projection, said fastening means further comprising a pair of resilient elastomeric strips disposed on opposite sides of its axle confining its axle within its elongate slot, each strip having portions thereof compressed during turning of the skateboard with the compressed portions serving to restore the associated axle to its original position after turning.

4,061,351
REMOVABLE SKATEBOARD HANDLE POST

Roger L. Bangle, 26264 Orchid Drive, Highland, Calif. 92346

Filed Oct. 26, 1976, Ser. No. 735,390
Int. Cl.[2] B62M *1/00*
U.S. Cl. 280—87.04 A 7 Claims



1. A handle post for attachment to a skateboard or the like comprising

a post having a base portion,

said post having a socket in said base portion,

an anchor piece in said socket, and

a tension bar extending through said post,

said bar being tensioned between said anchor piece and the top of said post, and

means for removably attaching said anchor piece to said skateboard,

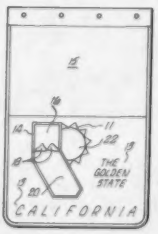
said post having an opening therein adjacent the top, and a handle extending in said opening, and

said tension bar extending through said handle whereby to lock said handle in said opening.

4,061,352
MUD GUARD

Gordon Bagne, Santa Ana, Calif., assignor to Plasticolor Molded Products, Inc., Placentia, Calif.

Filed Aug. 16, 1976, Ser. No. 714,612
Int. Cl.[2] B62D *25/16*
U.S. Cl. 280—154.5 R 7 Claims



1. A mud guard comprising:

a body of first plastic material;

a reinforcing material embedded in said body such that said first plastic material forms a thin skin coat providing a smooth face to said body; and

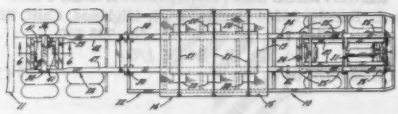
a raised design of a second plastic material molded with the body of said mud guard.

4,061,353

TRANSPORT LOCK FOR LIFT BED TRAILER

Stephen A. Kingman, Rensselaer, and Leslie A. Weaver, Monon, both of Ind., assignors to Eugene A. LeBoeuf, Gary, Ind.

Filed Jan. 20, 1976, Ser. No. 650,669
Int. Cl.² B62D *21/02*
U.S. Cl. 280—106 T **15 Claims**



3. In a lift bed highway trailer adapted for coupling to a tractor by means of a fifth wheel connection; the combination comprising:

a. a liftable main frame having a lowered loading and unloading position and a raised transport position;

b. a wheeled subframe underlying said main frame and pivotally connected to the same;

c. a gooseneck fixed to the forward end of said main frame;

d. a jackbox mounted within said gooseneck for vertical sliding movement relative thereto, said jackbox being adapted for attachment to the tractor fifth wheel;

e. power lift means for moving said main frame and gooseneck between the lowered loading and unloading position and the raised transport position; and

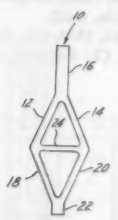
f. a pair of power actuated shot pins disposed in the longitudinal center plane of the trailer, said shot pins being mounted in said jackbox in axially spaced relation with each other adapted respectively to engage said gooseneck and lock same in the raised transport position.

4,061,354

STRUCTURAL UNIT FOR SWINGARMS

John Tudor Blum, Gardena, Calif., assignor to Cross Up, Inc., Wilmington, Calif.

Filed Oct. 15, 1976, Ser. No. 732,669
Int. Cl.² B62K *19/04*
U.S. Cl. 280—288 **3 Claims**



1. A motorcycle swingarm structural member comprising:

an extruded member of predetermined length,

said member throughout its length having a central body portion which in cross-section is a diamond with a crossweb connecting the obtuse angles thereof,

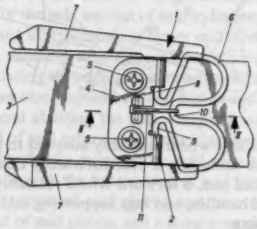
and respective fins integral with and extending the lengths of the acute angles of said member.

4,061,355

SKI BRAKE

Heinz Korger, Munich, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany

Filed June 16, 1976, Ser. No. 696,716
Claims priority, application Germany, June 16, 1975, 2526909
Int. Cl.² A63C *7/10*
U.S. Cl. 280—605 **7 Claims**



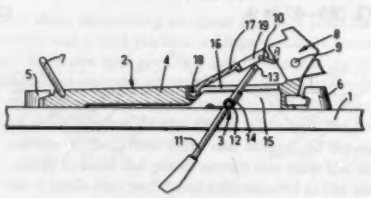
1. In a ski brake adapted to be attached to a ski surface and having the form of a two-armed lever having a pivot which is adapted to extend along the ski surface transversely to the length of the ski and one arm of which serves as a pedal for actuation by a ski boot, whilst the other arm is bifurcated and forms two brake prongs on the outside of the ski, the pedal arm being so spring-loaded that, when the boot is removed, the brake automatically assumes its braking position in which the prongs project downwardly beneath the ski, the improvement comprising the pedal being formed in a substantially M-shape out of a spring wire frame and a coupling member hinged at one end to the central portion of the spring wire frame which lies spaced from the pivot on one side thereof, the other end of said coupling member adapted to be pivotally mounted to the ski on the side of the pivot remote from said central portion of the spring wire frame.

4,061,356

SAFETY ARRANGEMENT FOR A SKI

Georges Pierre Joseph Salomon, Chemin de la Prairie prolonge, 74003 Annecy, France

Filed Apr. 2, 1976, Ser. No. 673,103
Claims priority, application France, Apr. 8, 1975, 75.10921
Int. Cl.² A63C *7/10*
U.S. Cl. 280—605 **11 Claims**



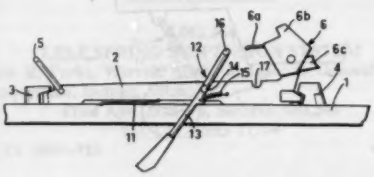
1. A safety arrangement for a ski comprising a binding having a plate, a brake in the form of a spade pivoted on the ski and normally biased by a resilient member into an active position in which said spade projects below the sole of said ski, said spade being retractable into an inactive position against the action of said resilient member, retainer means on said plate for retaining a skier's boot on said plate, and means on said plate for cooperating with said boot to enable said boot to move said spade into said inactive position when said plate is fitted on said ski and the skier's boot is positioned on said plate to be retained by said retainer means.

4,061,357

SKI BINDING HAVING A RELEASABLE BOOT PLATE PROVIDED WITH A SKI BRAKE

Georges Pierre Joseph Salomon, Chemin de la Prairie prolonge, 74003 Annecy, France

Filed Mar. 31, 1976, Ser. No. 672,445
Claims priority, application France, Apr. 3, 1975, 75.10434
Int. Cl.[2] A63C 7/10
U.S. Cl. 280—605 10 Claims



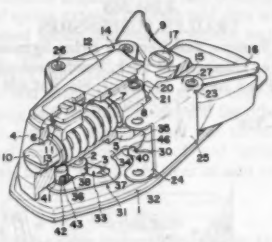
1. A ski binding comprising a plate engageable by a skier's boot, releasable means for securing said plate on a ski and enabling said plate to separate from said ski if the skier should fall, a ski brake supported by said plate and comprising at least one spade pivoted on said plate, and a member movable by engagement with said boot to control said spade so that said spade is retracted into an inactive position above the ski sole when said boot is placed on the plate and projects downwardly into an active position below said ski sole when said boot is separated from said plate.

4,061,358

SKI BOOT TOE BINDING

Masahiro Murata, Matsudo, Japan, assignor to Hope Co. Ltd., Tokyo, Japan

Filed Aug. 13, 1976, Ser. No. 714,016
Claims priority, application Japan, Oct. 31, 1975, 50-132017
Int. Cl.[2] A63C 9/08
U.S. Cl. 280—629 7 Claims



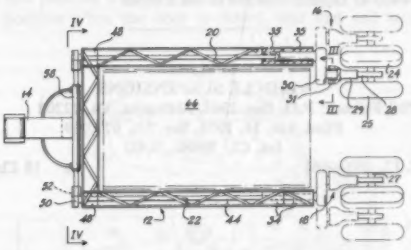
1. A ski boot toe binding comprising a base plate adapted to be attached on a ski, a pivot body, a pin extending upwardly from said base plate and through said pivot body thereby pivotably mounting said pivot body on said base plate, a toe holding member swingably mounted on said pivot body for receiving a boot toe, a pair of arms, one at each side of said plate, each pivotably connected at one end thereof to said pivot body and at the other end thereof to said toe holding member, an opening in said pivot body, yieldable means provided in said opening and acting upon said toe holding member to urge the latter to a toe holding center position, a cam plate provided between said base plate and said pivot body and movable from a locking position to an unlocking position, means mounting said cam plate for sliding movement with respect to said base plate and pivot body and for rotating movement about said pin, cooperating interengageable means on said cam plate and said arms normally disengaged with respect to both arms while said toe holding member is in the boot toe holding central position, said toe holding member and one of said arms being adapted to be swung upon the application of a first predetermined force, from the central position thereof through a predetermined stroke to a locking position of the toe holding member where said interengageable means is engaged with respect to one of said arms, and said pivot body is immovably engaged with said base plate, and said cam plate being slidably moved in the lengthwise direction of said base plate by said one arm after said toe holding member is swung beyond said predetermined stroke by the application of a force greater than said first force and assuming a rotated unlocking position where the engagement between said pivot body and said base plate is released, thereby allowing said pivot body to rotate about said pin on said base plate and release said toe holding member from the ski boot toe.

4,061,359

VEHICLES

Edward Geoffrey Metcalfe, and Walter Henry Ward, both of Vereeniging, South Africa, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Apr. 19, 1976, Ser. No. 678,177
Claims priority, application United Kingdom, Apr. 18, 1975, 16225/75
Int. Cl.[2] B62D 21/14
U.S. Cl. 280—638 9 Claims



1. A vehicle comprising a frame having a forward portion and two side portions, at least one support assembly attached to each side portion of the frame, each support assembly including at least one generally horizontal fore and aft extending torque shaft rotatably mounted on the frame, a crank arm secured to one end of the torque shaft, a wheel assembly pivotally attached to the crank arm and adjusting means to hold the torque shaft in one of at least two positions to position the wheel assembly laterally relative to the frame.

4,061,360

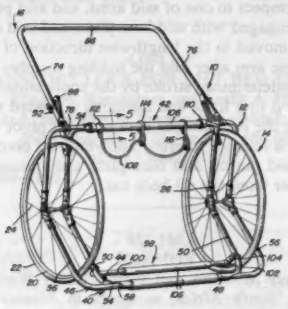
COLLAPSIBLE GOLF BAG CART

Frank E. Evans, and Dorothy D. Evans, both of 645 Cheowa Circle, Knoxville, Tenn. 37919

Filed Feb. 23, 1976, Ser. No. 660,145
Int. Cl.[2] B62B 11/00
U.S. Cl. 280—652 10 Claims

1. A golf bag cart comprising a frame, a pair of wheels supporting said frame for movement along a supporting surface, means on said frame supporting at least one golf bag, and handle means connected with the frame for enabling manual control and manipulation of the cart, said frame being foldable and including means engaging and securing the wheels to the frame when in extended position and releasing the wheels in response to movement of the frame to a folded condition for enabling storage of the wheels and frame in a compact condition, each of said wheels being provided with an axle projecting laterally from each side of the wheel, each end of each axle including a sleeve rigid thereon with each end of the sleeve having a flange rigid therewith, said frame including a pair of U-shaped frame assemblies having the end portions of the legs

pivotally connected to enable the bight portions to pivot from a position generally alongside of each other to a position with the legs disposed in angular relation, said means securing and releasing the wheels including hook-like members on the free



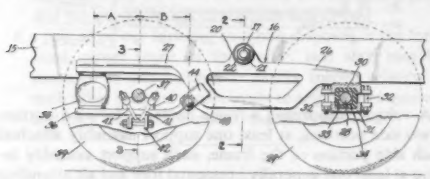
end portion of each leg of the U-shaped frame assembly and including facing notches which coact with each other for gripping engagement with the sleeves on the wheel axles when the U-shaped frame assemblies are pivoted so that the legs are disposed in angular relation to each other.

4,061,361

VEHICLE SUSPENSIONS

J. Phil Felburn, P.O. Box 2344, Arlington, Va. 22202

Filed Apr. 14, 1976, Ser. No. 677,049
Int. Cl.² B60G *19/02*
U.S. Cl. 280—681 **18 Claims**



1. A suspension for a vehicle having a frame including a pair of laterally spaced, longitudinally extending channels, comprising:

a pair of walking beams, each pivoted intermediate its ends to a respective channel to extend generally parallel thereto, said walking beams having one set of common ends on one side of the pivot and another set of common ends on the other side of the pivot,

a first axle secured crosswise to respective ones of said one set of common ends and supporting a road-engaging wheel,

a pair of support arms, each pivotally associated with a respective one of said walking beams,

a pair of air bags, each disposed between and having its opposite ends connected to a support arm and a respective one of the other set of common ends of said walking beams, each air bag and its related support arm and walking beam end combining to support a second axle, and a road-engaging wheel supported by said second axle,

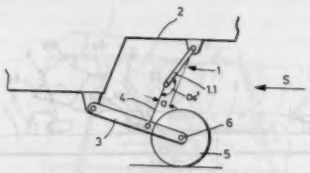
each support arm having one end pivotally connected to its related walking beam below the latter's pivot and in a direction toward the related air bag, each support arm underlying and vertically spaced from the related walking beam end, the related air bag being disposed in the vertical space.

4,061,362

REAR AXLE STABILIZER

Ernst Bufler, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Germany

Filed May 13, 1976, Ser. No. 686,009
Claims priority, application Germany, May 24, 1975, 2523121
Int. Cl.² B60G *11/00, 21/00*
U.S. Cl. 280—689 **3 Claims**



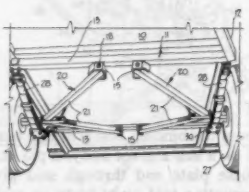
1. A stabilizer for use in conjunction with the rear axle of a vehicle having a chassis, wherein said axle is flexibly mounted to said chassis, comprising a U-shaped stabilizer bar, having a midsection and two arms, and tie rods pivotally mounted to each of said arms, said stabilizer being pivotally mounted between said chassis and said axle by said tie rods and said midsection, said stabilizer having selected dimensions and mounting locations to form an angle between said tie rods and said arms, measured in a plane perpendicular to said axle, of approximately 90° when said vehicle is assembled and fully loaded, resulting in a first leverage for converting rolling forces of said vehicle into torsion forces on said stabilizer bar, and causing said stabilizer bar to exert a first roll-restoring moment between said chassis and said axle, said angle increasing to more than 135° when said vehicle is unloaded but fully assembled, resulting in a second and lower leverage for converting said rolling forces into torsion forces on said stabilizer bar, and causing said stabilizer bar to exert a second and greater roll restoring moment between said chassis and said axle.

4,061,363

TRAILER SUSPENSION

Cedric Brian Symons, and Kenneth Brian Symons, both of 59 Narinna Ave., Cumberland Park, South Australia, Australia

Filed June 2, 1976, Ser. No. 635,408
Int. Cl.² B60G *5/00*
U.S. Cl. 280—718 **6 Claims**



1. A trailer suspension and chassis construction, comprising a chassis, at least one pair of Y-shaped wheel frames each of which has a pair of frame members, means joining the frame members together at one end to diverge therefrom, and a wheel axle projecting from the joined ends,

pivot means joining the divergent ends of the frame members of each respective wheel frame to the chassis for independent pivotal movement of the frames about axes which extend longitudinally with respect to the direction of travel,

a respective leaf spring fixed intermediate its ends with respect to each said wheel axle, abutment pads on the chassis, the leaf spring ends abutting respective said abut-

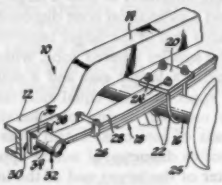
ment pads, each said abutment pad being of inverted "U"-shape and having a pair of depending flanges which flank a respective said spring end, the space between said flanges exceeding the width of the spring end flanked thereby to allow the spring end to slide back and forth on the abutment pads and to have a slight sideways movement, and further comprising bearing means joining respective said abutment pads to said chassis for pivotal movement of the abutment pads about longitudinally extending axes.

4,061,364

LEAF SPRING SUSPENSION SYSTEM

Robert R. Parks, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1976, Ser. No. 681,540
Int. Cl.[2] B60G *11/04*
U.S. Cl. 280—718 **4 Claims**



1. A compliant hanger mechanism for use on a vehicle having a side frame having a side surface, a pair of rear wheels, a rear axle mounting said rear wheels, a set of leaf springs mounting said rear axle, said leaf spring set including a main leaf spring and a spring eye-end at the end of said main leaf spring; said hanger mechanism comprising: a housing; a mounting flange on one end of said housing; means for fastening said mounting flange to said side surface; a slot extending along the side of said housing; rubber bushing means within said housing, said bushing means including two end portions, side portions extending from said end portions, and a slot extending along said side portions in alignment with said housing slot whereby said main leaf spring extends through said slots with said spring eye-end retained within said bushing means; and means on the other end of said housing for retaining said bushing means therein, whereby said fastening means preloads said bushing means within said housing with one of said ends of said bushing means engaging said retaining means and the other of said ends of said bushing means engaging said side surface to permit a predetermined lateral movement of said spring eye-end to provide lateral force compliance steer of said rear wheels.

4,061,365

SAFETY SYSTEM FOR PROTECTION OF AUTOMOTIVE SEAT OCCUPANT

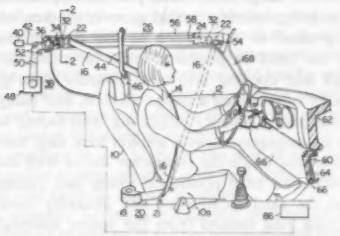
Toshio Nagano, Tachikawa, and Kazuo Kuramoto, Koganei, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 25, 1975, Ser. No. 635,087
Claims priority, application Japan, Nov. 29, 1974, 49-137928; Nov. 29, 1974, 49-137929
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—745 **10 Claims**

1. In combination with an automobile the body of which includes a seat supported on a floor, a door adjacent the outboard side of the seat, a first body member located forwardly of and distant from the seat and a second body member located substantially upwardly of the door, a safety system for protecting an occupant of the seat, comprising:

a frame member secured to the first body member and a cushioning member attached to and covering a surface of said frame member facing the front edge of the seat, said cushioning member being shaped and arranged such that the knees and legs of the occupant in the seat come into contact with said cushioning member when the lower half of the occupant's body moves forwards; and

a passive safety belt assembly comprising (a) a guide rail secured to the second body member and located generally upwardly of the door, the front and rear ends of said guide rail being located forwardly of the front edge of the seat and rearwardly of the rear end of the seat, respectively, (b) a carrier member slidably engaged with said guide rail, (c) a safety belt coupled with said carrier member and supported at a first end thereof on the floor at a location close to the rear end of the inboard side of the seat, a second end of said belt being held substantially on the axis of said guide rail, (d) a retractor stationarily arranged to hold one said second end of said belt, said retractor being of a type capable of automatically retracting and locking said belt in a collision of the automobile, a buckle fixed to said carrier member and an anchor member connected to said end of said belt and detachably coupled with said buckle said retractor being located close to the rear end of the inboard side of the seat and connected to said first end of said belt, (e) drive means for selectively bringing said carrier member to first and second positions respectively close to said front and rear ends of said guide rail, and (f) control means for controlling the operation of said drive means such that said carrier member is brought to said first position when the door is opened and to said second position when the door is closed, said first and second



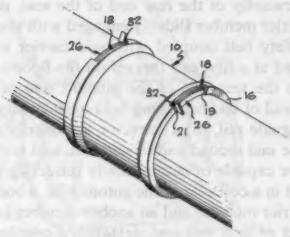
positions and the length of said belt being arranged such that said belt is slackened when said carrier member is in said first position and passed diagonally around the upper half of the seated occupant's body to extend from the waist of the occupant on the inboard side to the shoulder on the other side when said carrier member is in said second position, wherein said drive means comprises a reversible motor, a drive pulley, an idler pulley located forwardly of said first position, and a rope tensioned and passed around said drive pulley to extend therefrom towards said guide rail, one end of said rope being connected to said carrier member, the other end of said rope being connected to said carrier member after being passed around said drive pulley and said idler pulley, and wherein said control means comprise a first power circuit having first contacts to revolve said motor in the positive direction when said first contacts were closed, a second power circuit having second contacts to revolve said motor in the negative direction when said second contacts are closed, a first control circuit having in series with one another a first solenoid coil causing said first contacts to close when excited, a first door switch closing only when the door is open and a first limit switch opening only when said carrier member is in said first position, a second control circuit having in series with one another a second solenoid coil causing said second contacts to close when excited, a second door switch opening only when the door is open and a second limit switch opening only when said carrier member is in said second position.

4,061,366

CONNECTOR

Stephen N. Affa, 23517 Ladeene, Torrance, Calif. 90505

Filed Oct. 1, 1975, Ser. No. 618,507
Int. Cl.² F16L *17/00*
U.S. Cl. 285—37 6 Claims



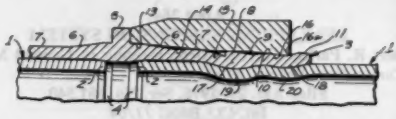
1. A manually operable high pressure tubular gas connector for aircraft comprising a connector sleeve and a connector tube, said connector sleeve having opposed ends and wall formations shaped to form a radially extending inwardly open groove, said inwardly open groove having opposed radially projecting planar walls communicating with the inner surface of the connector sleeve, a planar radially inwardly projecting circular flange on at least one end of the connector sleeve forming a planar wall of said inwardly open groove, a part of said circular flange removed to provide an external spiral lock ring receiving opening to said groove, the arc length of said opening small in comparison to the circumference of said flange but sized to permit a spiral lock ring to be wound through said opening into said inwardly open groove, said connector tube having a flange thereon, said flange having at least one planar radially projecting wall facing said circular flange for engagement with a spiral lock ring, said connector tube mounted inside the connector sleeve with said flange of said connector tube positioned inside said connector sleeve beyond the axial location of said inwardly open groove, a spiral lock ring formed from flat spring material associated with said connector sleeve, the diameter of said spiral lock ring generally equal to the internal diameter of the depth of the groove, said spiral lock ring having planar walls and a thickness generally equal to the width of said groove whereby the planar walls of the groove engage and support the planar walls of the spiral lock ring to prevent vibration movement of the spiral lock ring in said groove, the walls of the spiral lock ring having a length generally larger than the depth of said groove, said spiral lock ring removably positioned in said groove through said opening so a portion of said planar walls of the spiral lock ring projects inwardly beyond the depth of said groove to close the opening in said flange and to provide a wall for continuous abutment with the planar wall of the flange on the connector tube to releasably hold the connector sleeve and connector tube together whereby the connector tube can be locked in the sleeve whenever the flange on the connector tube is located anywhere inside the connector sleeve beyond the inwardly open groove and the spiral lock ring is then wound into said groove so the connector sleeve and the connector tube can be connected together without precisely positioning the connector tube inside the connector sleeve, the walls of the spiral lock ring sufficiently flexible to permit the spiral lock ring to be manually wound through said opening in said flange into said groove against a resistance which is generally constant and independent of the number of turns of the spiral lock ring, the size of the connector sleeve, and the size of the connector tube, whereby the connector sleeve and the connector tube can be manually connected together in the dark without tools.

4,061,367

LOCKRING TUBE JOINT

Kurt O. Moebius, P.O. Box 2339, Palos Verdes Peninsula, Calif. 90274

Continuation-in-part of Ser. No. 500,604, Aug. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 331,319, Feb. 9, 1973, Pat. No. 3,893,720. This application Sept. 12, 1975, Ser. No. 612,932
Int. Cl.² F16L *13/14*
U.S. Cl. 285—382.2 12 Claims



1. A lockring tube joint, comprising:

a. a lockring having internally at least a larger and a smaller tapered zone and a cylindrical zone disposed between and joining the smaller end of the larger tapered zone and the larger end of the smaller tapered zone, whereby the lockring has internally a larger end and a smaller end, the zones being of approximately equal axial length;

b. an outer tube member having peripherally distributed projection means of less axial extent than each of said zones, the effective diameter of which approximates the internal diameter of the larger end of the lockring;

c. an inner member initially slidable within the outer tube member;

d. said lockring adapted to be forced axially on the outer tube member, the larger tapered zone, on initial movement, causing the lockring to effect radially inward deflection of the projection means and the underlying portion of the outer tube member to effect interlocking engagement between the outer and inner members;

e. said lockring, on further movement, causing the cylindrical zone to slide on the projection means while maintaining said interlocking engagement;

f. said lockring, on continued movement, causing the smaller tapered zone to constrict an axial end of the outer tubular member to effect a second interlocking engagement between the outer and inner members;

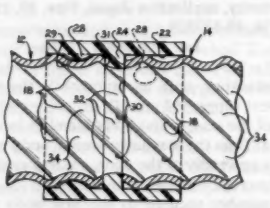
g. the axial force to effect movement of the lockring and cause said second interlocking engagement between said inner and outer members being confined essentially to the constricting force applied to the axial end of the outer member and the frictional force between the cylindrical zone and the projection means.

4,061,368

COUPLING FOR SPIRAL DRAIN PIPE

Robert Sinbad Auriemma, R.D. No. 1, P.O. Box 104, Bethel, Pa. 19507

Filed Sept. 25, 1975, Ser. No. 616,869
Int. Cl.² F16L *25/00*
U.S. Cl. 285—383 7 Claims



1. A coupling for joining lengths of spiral pipe comprising a

body having a cylindrical opening extending therethrough and defining an inner cylindrical surface, an interior flange projecting from the surface and extending at least partially around a circumference of the surface approximately midway between the ends of the opening, the flange including side walls extending inwardly from the surface and facing the ends of the opening and a top surface between the flange sidewalls made up of a series of sinuous recesses and crests extending along the length of the flange, and a pair of locking projections each projecting from the cylindrical surface, the flange being located between the projections, each projection extending a circumferencial distance around the cylindrical surface less than the circumferencial spacing between two adjacent recesses on the flange and a work surface located a distance from the surface equal to or less than the maximum height of the flange crests above the cylindrical surface less the minimum height of the flange recess above the cylindrical surface, the projections having a circumferential extent less than the spacing between adjacent recesses on the flange, each projection lying on a spiral traced on said surface and extending through a crest on the flange whereby, upon rotation of lengths of spiral pipe into the ends of the coupling the projections fit within the exterior spiral recesses in the pipe and the work surfaces engage the recesses to hold the ends of the pipes flush against the side walls of the flange and in alignment with the flange crests and recesses.

4,061,369

CATCHES

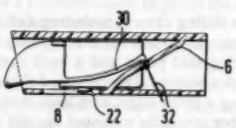
John P. Palmer, Reading; Stephen W. Isbister, Maidenhead, and John D. F. Elvin, Wokingham, all of England, assignors to ITW Limited, Slough, England

Filed June 17, 1975, Ser. No. 587,763

Claims priority, application United Kingdom, July 8, 1974, 30170/74

Int. Cl.² E05C *1/08*

U.S. Cl. 292—163 **4 Claims**



1. A two-piece plastic catch comprising an elongated plunger member and a centrally rectangular hollow open ended box-like guide member, the plunger member being complimentary to and able to reciprocate in the guide member, with a cam-shaped nose of the plunger member extending out of the guide member, each of the members being a single moulding of a plastics material, said plunger member including at least one tongue which extends primarily in the direction of relative reciprocation of the members and is resiliently flexible transversely to that direction, each tongue engaging cam means on the said guide member in such a manner that a force acts on the tongue of said plunger member having a component parallel to the direction of relative reciprocation of the members which urges the members towards a limit of relative reciprocation at which the extension of the nose out of the guide member is greatest, whereby if the nose is displaced into the guide member and is thereupon released then the plunger member returns to the said limit, said plunger member having a centrally located operating tail of less width than the nose, there being two of the said tongues carried on the plunger member at each side of the tail, the said cam means is constituted by two cams on the guide member with each of said cams being a web angularly disposed in the direction of reciprocation of the members and each extending inwardly in cantilever fashion from opposite side walls of said guide member in such a disposition that the free ends of the tongues are in opposition to and ride up said cams when the plunger member reciprocates into the guide member, and flange means for mounting said guide member on a workpiece.

4,061,370

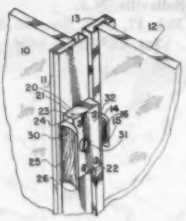
WINDOW LATCH

Peter Fritz Hauber, Burbank, Calif., assignor to Reflectolite Products Inc., Sun Valley, Calif.

Filed Feb. 26, 1976, Ser. No. 661,476

Int. Cl.² E05C *1/10, 1/04*

U.S. Cl. 292—175 **4 Claims**



1. A latch assembly comprising a body adapted to be attached to a window or door frame;

said body including a transverse aperture therethrough;

a unitary handle-latch member extending through said transverse aperture with a latching surface extending from said body on one side thereof and a handle extending from said body on the opposite side thereof;

said handle-latch member including a keyhole shaped aperture therethrough with an enlarged portion of said keyhole-shaped aperture positioned in the intermediate region of said handle-latch member between said handle and said latching surface with the enlarged portion nearer the handle and a constricted portion of said keyhole shaped aperture nearer the latching thereof;

a circular aperture in said body on one side of said handle-latch member communicating with said transverse aperture and said keyhole shaped aperture;

a locking member having a cylindrical portion of a size corresponding to said enlarged portion and being received within said circular aperture, said locking member including a substantially rectangular locking arm affixed to one end thereof with a portion of said arm extending laterally from said cylindrical portion, said arm dimensioned to have a width corresponding to said constricted portion and to rest in said keyhole shaped aperture when in unlocked position and with only the cylindrical portion thereof extending through the enlarged portion of the keyhole shaped aperture when depressed and rotated in the order of 90° to a locked position;

said body including a recess on the other side of said handle-latch member into which the arm of said locking member may be extended normal to the direction of movement of said handle-latch member;

a surface on said body engaging said arm when so extended and limiting the movement of said handle-latch member in the latch releasing direction;

said locking member operative in said locked position to prevent movement of said handle-latch member by engagement of the cylindrical portion thereof with the enlarged portion of the keyhole shaped aperture in said handle latch member;

said arm when in the locked position preventing withdrawal of the cylindrical portion from the enlarged portion of the keyhole shaped aperture;

said arm extends within said constricted portion of said keyhole shaped aperture in said handle latch member when in an unlocked position;

said arm having a length less than the length of said keyhole shaped aperture;

whereby the length of said arm limits the extent of unlocking movement of said handle-latch member;

first spring means urging said handle-latch member into a locking position; and

second spring means partially ejecting said locking member from said body when in an unlocked position.

4,061,371

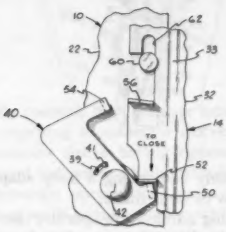
SELF-LOCKING DEVICES

Joseph E. Prather, Bernardsville, and Ramzi A. Khalifa, Rutherford, both of N.J., assignors to Edson Tool & Manufacturing Company, Inc., Belleville, N.J.

Filed Feb. 17, 1976, Ser. No. 658,265

Int. Cl.[2] E05C 3/04

U.S. Cl. 292—198 **15 Claims**



1. A self-locking device for locking a first enclosure member to a second enclosure member, or for unlocking the same, comprising:

a first enclosure member; a second enclosure member; a self-locking latching member rotatably mounted on said first enclosure member; and a ratatable actuating means rotatably mounted on said first enclosure member for rotating said self-locking latching member;

said self-locking latching member having a first ear thereon, capable of preventing said second enclosure member from movement in a first or opening direction, and a second ear thereon capable of preventing said second enclosure member from movement in an opposite direction, whereby said second enclosure member is locked with respect to said first enclosure member;

said second enclosure member having a first heel thereon adjacent to and facing said first ear on said self-locking latching member and a second heel thereon adjacent to and facing said second ear on said self-locking latching member;

a face on said first heel of said second structural member; and a face on said first ear of said rotatable self-locking latching member, said face on said first heel being so angularly positioned and in such spatial relationship with respect to said face on said first ear and with respect to the center of rotation of said rotatable self-locking latching member during the closed position of said enclosure members that forcible movement of said face on said first heel against said face on said first ear in said first or opening direction causes said first heel to move and to abut against the face on said first ear with a relatively large force on said rotatable self-locking latching member but which force is essentially radial in direction with respect to the center of rotation of said rotatable self-locking latching member and thus creates essentially no rotational force on said rotatable self-locking latching member, whereby movement of said second enclosure member in said first or opening direction is prevented and the closed position of said enclosure members is maintained;

said rotatable actuating means being capable of rotating said self-locking latching member, whereby said second ear on said self-locking latching member contacts said second heel on said second enclosure member and forcibly moves it in said first or opening direction, while said first ear on said self-locking latching member is being simultaneously rotated out of the way of said first heel on said second enclosure member to permit movement of said second enclosure member in said first or opening direction to open and to unlock said second enclosure member from said first enclosure member;

and said second heel on said second enclosure member being subsequently capable of being moved in said opposite direction to contact said second ear on said self-locking latching member to forcibly rotate said self-locking latching member in a direction opposite to that of the first rotation, whereby said second enclosure member returns to its original closed and locked position with respect to said first enclosure member, being automatically locked therein by said first ear and said second ear of said self-locking latching member.

4,061,372

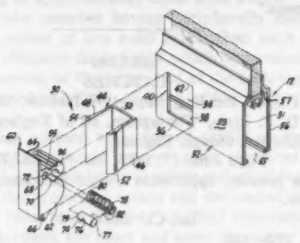
SECONDARY LOCK FOR SLIDING DOOR OR WINDOW

LeRoy A. Cardoso, Sacramento, Calif., assignor to Blomberg Glass, Sacramento, Calif.

Filed Apr. 5, 1976, Ser. No. 673,666

Int. Cl.[2] E05C 3/04

U.S. Cl. 292—207 **9 Claims**



1. A lock for a sliding closure including a sliding vent movable in a plane parallel to a fixed vent having a panel with a front surface facing said plane and a back surface, the panel being formed with a rectangular aperture defined by a plurality of edges including a pivot edge, said lock comprising:

a. a stop member pivotally mounted on said pivot edge and being rockable between an unlocked position in which said sliding vent clears said stop member upon opening movement of said sliding vent and a locked position in which said sliding vent is immobilized by engagement with said stop member, said stop member including a pin retaining hole formed therein parallel to said pivot edge of said aperture in said panel, said stop member further including a spring retaining hole formed therein in a direction parallel to said pin retaining hole, said stop member being further formed with a slot connecting said pin retaining hole and said spring retaining hole;

b. a pin slidable in said pin retaining hole;

c. a compression spring housed in said spring retaining hole in said stop member urging one end of said pin to protrude from said stop member, said one end of said pin protruding from said stop member and being laterally disposed between said front surface of said panel and said plane when said stop member is in locked position, said spring being connected to said pin through said slot; and,

d. a housing having first and second parallel walls perpendicularly extending from said back surface of said panel from the edges of said panel defining said rectangular aperture which are perpendicular to said pivot edge, said stop member being rockable between and in a direction parallel to said first and second walls;

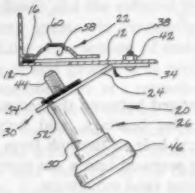
said one end of said pin being urged by said spring into abutment with said first wall when said stop member is in unlocked position; an end of said spring abutting said

second wall in both unlocked and lock position of said stop member.

4,061,373
DOOR LATCH DEVICE

Alan E. Revell, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed May 5, 1976, Ser. No. 683,538
Int. Cl.² E05C 5/04
U.S. Cl. 292—251 7 Claims



1. A door latch device for securing a door in place over an enclosure defined opening, the door latch device comprising:

a. a latch mechanism comprising:

an elongated resilient retainer having an elongated aperture proximate one end with the longitudinal axis of the elongated aperture being coextensive with the longitudinal axis of the elongated retainer, the end of the elongated resilient retainer having the elongated aperture being disclosed at a predetermined angle to the other end of the elongated resilient retainer;

means for attaching the other end of the elongated retainer to the door;

a screw-type fastener having a threaded shank extending through the elongated aperture in the retainer;

manipulating means disposed at one end of the threaded shank; and,

means for attaching the screw-type fastener in the elongated aperture while allowing the screw-type fastener to rotate about its longitudinal axis and move along the longitudinal axis of the aperture comprising:

shoulder means disposed on the shank of the screw-type fastener for abutting one side of the elongated resilient retainer; and,

a resilient body keeper means having an aperture therethrough of a smaller diameter than the diameter of the shank of the screw-type fastener, the shank of the screw-type fastener protruding from the other side of the elongated resilient retainer, the shoulder means being coaxially receivable through the aperture in the resilient body keeper means displacing some of the material of the resilient body defining the aperture therethrough thereby causing the resilient body to tightly grip the shank of the screw-type fastener to captively hold the elongated resilient retainer between the resilient body keeper means and the shoulder means;

b. a latch plate securable to the enclosure defining opening comprising:

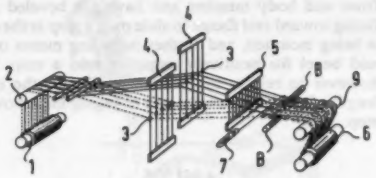
means defining a depression in the plate; and,

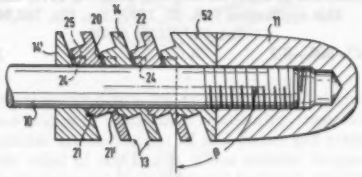
means defining a threadable aperture through the plate in the depression, the threads of the aperture conform to the threads of the screw-type fastener so as to threadably receive the shank of the fastener.

4,061,374
WIDTH-MAINTAINING CYLINDER

Jack G. Altmann, Tann-Rueti, Switzerland, assignor to G. Hunziker AG, Rueti, Switzerland

Filed June 10, 1976, Ser. No. 694,711
Claims priority, application Switzerland, June 24, 1975, 8217/75
Int. Cl.² B65H 17/20
U.S. Cl. 308—1 R 8 Claims



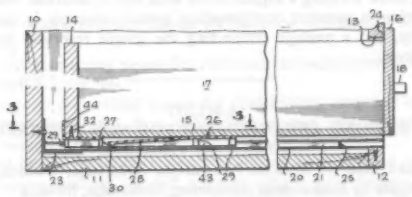


1. In a width-maintaining cylinder having at least one bearing arranged on a support at an angle to the longitudinal axis, the bearing having a flange and a circular cylindrical bearing surface for a small wheel set at an angle, wherein the bearing has contact surfaces on both sides and can be clamped on the support between two tensioning elements, the improvement comprising wherein the contact surfaces of the bearing, which can be pressed again one another, are at right angles to the longitudinal axis of the support.

4,061,375
MOULDED PLASTIC DRAWER SLIDE

Paul M. Mertes, 15528 Don Metz St., Granada Hills, Calif. 91344

Continuation-in-part of Ser. No. 576,349, May 12, 1975, abandoned. This application July 12, 1976, Ser. No. 704,649
Int. Cl.² F16C 21/02
U.S. Cl. 308—3.6 12 Claims



1. A universal drawer slide to be secured to the rear bottom of a drawer to engage a matching track, said drawer slide comprising:

a delta shaped moulded plastic body member;

two downwardly depending guides each being of generally L-shaped cross section, for engaging a matching track, extending substantially the length of said member;

an upwardly directed flange for overlying the rear end of a drawer;

said delta shaped body member having its widest portion at the rear of the drawer and its narrowest portion towards the front thereof, and said widest portion extending a substantial distance on either side of said downwardly depending guides; and

an integrally moulded hook formed of a length of plastic mounted between said two guides and resiliently pivotted to extend toward said flange, said hook extending down from said body member and having a beveled surface facing toward said flange to slide over a stop as the drawer is being mounted, and further including means opposite said bevel for positively engaging said a stop, subject however to release by pressure applied to the exposed length of the hook to raise said engaging means over said stop.

4,061,376

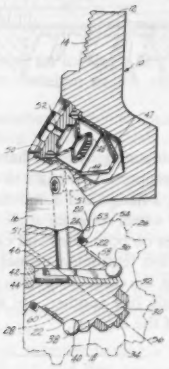
ROCK BIT BEARING STRUCTURE

Arthur A. Villaloboz, Huntington Beach, Calif., assignor to Smith International Inc., Irvine, Calif.

Continuation of Ser. No. 695,906, June 14, 1976, abandoned. This application Feb. 15, 1977, Ser. No. 768,944

Int. Cl.² F16C *19/06*

U.S. Cl. 308—8.2 **26 Claims**



1. A rock bit comprising a drill bit body having a journal bearing spindle shaft, a rotary cutter cone rotatably supported on the shaft, the shaft having a cylindrical bearing portion, the cutter cone having a cylindrical bore extending around the bearing portion for forming a friction bearing, the bearing portion of the shaft having a shallow groove extending around the periphery thereof, bearing metal applied in the groove over less than about half the circumference of the groove, the bearing metal forming a surface flush with said cylindrical bearing portion, a pressure compensating grease reservoir in the bit body, and a passage connecting the grease reservoir to the groove.

4,061,377

BEARING ARRANGEMENT FOR NON-POWERED WHEELS ON VEHICLES

Sigurd Andrew Mauritz Nordström, Sodertalje, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

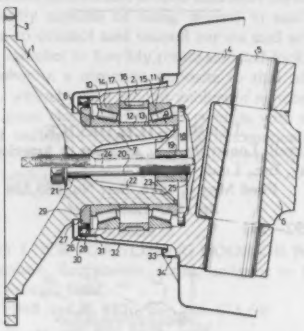
Filed June 29, 1976, Ser. No. 700,952

Claims priority, application Sweden, July 7, 1975, 7507754

Int. Cl.² F16C *35/06*

U.S. Cl. 308—207 R **7 Claims**

1. Bearing arrangement for a non-powered wheel on vehicles of the kind wherein the hub of the wheel has a hub neck which engages in a sleeve which is non-rotatably secured in the vehicle, two roller bearings being arranged between the hub neck and the sleeve, the hub and the roller bearings being held in the assembled position in the sleeve by means of a centrally positioned hub bolt, the improvement wherein each roller bearing has inner and outer rings, said roller bearings having races inclined towards each other, and inner and outer spacer



sleeves are arranged between the respective inner and outer rings of the roller bearings, said hub bolt passing freely through a central hole of the hub from the outer side of the same and being screwed into a nut surrounded by the sleeve and locked against axial movement.

4,061,378

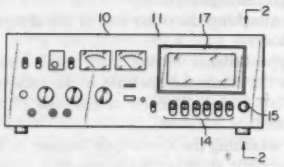
CASSETTE TAPE RECORDER HAVING IMPACT ABSORBING MECHANISM FOR COVER PLATE

Shigeru Matsumoto, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Dec. 23, 1975, Ser. No. 643,759

Int. Cl.² A47B *81/00*

U.S. Cl. 312—20 **13 Claims**



1. A cassette-tape recording and reproducing apparatus comprising, in combination, a housing having an opening for accommodating a tape cassette therein, a cover plate for said opening pivotally supported to be manually rotatable from an open position to a closed position, means for pivotally supporting said cover plate for movement relative to said housing and opening, urging means for constantly urging the cover plate to rotate from said closed position constantly to said open position, locking means for releasably locking the cover plate in said closed position, means manually operable from outside of the housing for selectively releasing the locking means, and a shock absorber connected between the cover plate and the housing to absorb energy developed when said cover plate is rotated from said closed position to said open position by said urging means upon release of said locking means by manual operation of said releasing means.

8. The combination comprising, a housing having a compartment therein open at one side of the housing to receive an article therein, a cover plate pivotally supported by the housing between a first position in which said compartment is open to the atmosphere and a second position in which said compartment is closed thereby, means for urging the cover plate in a direction toward said first position, means for locking the

cover plate in said second position, means for releasing the locking means, and a fluid pressure mechanism comprising:

a pair of relatively movable telescoping members, one of said members being connected operatively to the cover plate and the other being operatively connected to the housing such that when the cover plate is in the second position said telescoping members are in an extended position, one of said members having a packing groove, and

a resilient elastic composition packing ring of normally circular cross section positioned in said groove in a resilient, slidable contact with the other element,

one of said members having a bore to receive the other member through an open end, one of said members having an air vent passage communicating the interior of said bore to the atmosphere,

the inner periphery of said packing ring being slightly smaller in circumference than the circumference of the bottom of said groove and the exterior periphery of the packing ring being greater in circumference than the circumference of the cross section of said bore, whereby said packing ring in said groove is in compression when said telescoping members are in a retracted position,

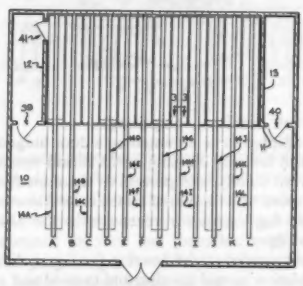
the cross-sectional dimension of said air vent passage being selected such that the pressure within the bore sharply increases when said telescoping members move toward each other upon said locking means being released to thereby absorb the initial force of the urging means.

4,061,379

LOCKER SYSTEM

Lee S. Randall, 222 Crampton Drive, Monroe, Mich. 48161

Filed Jan. 3, 1977, Ser. No. 756,120
Int. Cl.[2] A47B *53/00*
U.S. Cl. 312—201 **13 Claims**



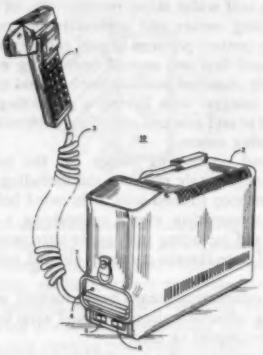
1. A multiple locker storage system comprising, in combination, a plurality of side-by-side adjacent rows of lockers with each row including a plurality of individual adjacent lockers having openings forming the lateral faces of each row, means for moving each row relative to the others in a direction parallel to their lateral faces from a retracted, closed position to an extended, open position, said lockers, when in said retracted, closed position defining a rectangular block with the exposed face thereof formed by the generally co-planar row ends defining a room wall preventing access to the lateral faces of said rows from said room, whereby, when all of said rows are in closed, retracted position said lateral faces of adjacent rows are closely adjacent and opposite each other to prevent access to the lockers therein and whereby, when selected row is moved to open, extended position, its lateral faces are exposed to provide access to the lockers in such extended row.

4,061,380

ROTATIONAL STRAIN RELIEF WITH INLINE PLUG

Joe B. Carnahan, Carrollton, and Robert B. Koenig, Dallas, both of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed Dec. 27, 1976, Ser. No. 754,852
Int. Cl.[2] H01R *39/00*
U.S. Cl. 339—8 R **7 Claims**



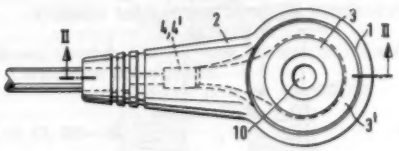
1. An interconnect device for mechanically and electrically joining two bodies in a rotational relationship, comprising a tubular member secured to one of said bodies and extending through the other of said bodies, a bias member cooperating with said tubular member to hold said bodies in an abutting relationship and electrical wires extend through said tubular member into each of said bodies in a manner to permit rotation of one of said bodies in relation to the other.

4,061,381

TWIST PREVENTION DEVICE

Henri Smal, Oupeye, Belgium, assignor to Societe Anonyme FACO, Oupeye, Belgium

Filed July 13, 1976, Ser. No. 704,949
Claims priority, application Belgium, July 18, 1975, 645098
Int. Cl.[2] H01R *39/00*
U.S. Cl. 339—8 P **6 Claims**



1. A twist prevention device for electrical conductors, comprising

a first connecting means for receiving incoming current and defining an axis,

a second connecting means for transmitting outgoing current from said first connecting means and rotatably mounted relative to said first connecting means,

said first and second connecting means being formed with corresponding stepped section means each having an uppermost narrowmost step, and wider steps for permitting easy assembly and disassembly relative to one another,

said first connecting means for incoming current includes cable shoes comprising pear-shaped flat members defining planes extending perpendicularly to said axis and each cable shoe including a neck portion extending laterally away from said axis laterally beyond said stepped section

means, said neck portion connected to a power supply cable at a poinyt laterally spaced away from said stepped section means and each said cable shoe including an annular contact portion located in stepped position with respect to one another relative to the axis of said first connecting means,

said second connecting means for the outgoing current consists exclusively only of two helically wound conductors, each forming a wire spring arranged in stepped position on said wider steps, respectively, of the said second connecting means and separately in contact with said annular contact portions of said cable shoes, respectively, when said first and second connecting means are in the rotatably mounted position, each of said springs constituting an integral wire having a projecting end extending parallel to said axis and extending to outside of said second connecting means,

said second connecting means for the outgoing current comprising a male member and including said upper narrowmost step formed with a threaded hole,

said first connecting means comprising a stepped female sleeve and including said upper narrowmost step having an axial bore therein coaxially aligned with said threaded hole,

said first connecting means being formed with an enlarged opening communicating with said axial bore and forming a screw support surface,

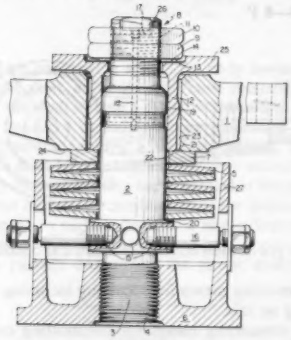
a screw member having a screw head rotatably supported on said support surface of said first connecting means and having a screw shank extending screwed into said threaded hole of said second connecting means terminating spaced above apart from said wider steps, so as to permit relative rotation of said first and second connecting means and to prevent relative longitudinal movement.

4,061,382

DOOR LOCKING MECHANISM FOR COKE OVEN DOOR

Klaus-Peter Dahl, Gelsenkirchen, Germany, assignor to Didier Engineering GmbH, Essen, Germany

Filed Dec. 21, 1976, Ser. No. 753,090
Claims priority, application Germany, Dec. 31, 1975, 2559311
Int. Cl.² E05C *19/00*
U.S. Cl. 292—260 **8 Claims**



1. A door locking mechanism for locking doors, particularly coke oven doors of the type wherein when in the locked position the door is pressed against a door frame by spring pressure and held in such position by a locking bar engaged against hooks on the door frame, said mechanism comprising:

an integral and single-piece bolt having an inner end adapted to be threaded into a door body of a door to be locked and an outer end;

a sleeve element axially slidably mounted about said bolt;

a locking bar rotatably mounted about said sleeve element with said outer end of said bolt extending outwardly beyond said locking bar, said locking bar having arms adapted to be engaged behind hooks of a door frame of the door to be locked to lock the door;

spring means supported by said bolt and urging said sleeve element and said locking bar outwardly of said bolt toward said outer end thereof;

said sleeve element being movable axially of said bolt toward said inner end thereof to compress said spring means and to thus release the pressure of said spring means from said locking bar, such that said locking bar can be rotated;

means, threaded onto said outer end of said bolt at a position outwardly of said locking bar and contacting said sleeve element, for selectively axially displacing said sleeve element with respect to said bolt and for thereby adjusting the spring pressure of said spring means applied to said locking bar; and

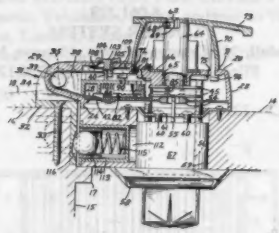
means, at said outer end of said bolt and positioned outwardly of said locking bar, for selectively rotating and axially displacing said bolt with respect to the door and thereby adjusting the circumferential position of said locking bar with respect to the hooks of the door frame, said bolt rotating means being freely accessible from the exterior without removal of said sleeve element displacing means.

4,061,383

AUTOMATICALLY LOCKING CROSSBOLT DEADLOCK

Russell W. Waldo, St. Paul, Minn., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.

Filed Oct. 21, 1976, Ser. No. 734,734
Int. Cl.² E05C *1/16*
U.S. Cl. 292—335 **9 Claims**



1. A crossbolt deadlock comprising:

a housing adapted to be mounted on a door hinged in a door frame, said housing defining notch means opening generally toward an adjacent portion of the door frame;

a strike adapted to be mounted on the door frame and having apertured lug means for reception in the notch means when the door is closed;

a crossbolt mounted in the housing for linear sliding movements relative to said housing and toward and away from locking engagement with said strike;

an actuator lever in said housing for releasably holding said crossbolt in a position away from engagement thereof with said strike, said actuator lever having an inner end within said housing, an angularly displaced outer end projection outwardly through an opening in said housing and toward the door frame when said housing is mounted on the door, and a crossbolt engaging portion intermediate its ends within said housing;

means pivotally mounting said inner end of the actuator to said housing for swinging movements toward and away from engagement of said crossbolt engaging portion with said crossbolt;

spring means urging said actuator lever in a direction of said swinging movement toward said crossbolt;

said outer end of the actuator lever being disposed to abuttingly engage a portion of said strike spaced from said lug means responsive to closing of the door to move said

actuator lever in a direction to disengage the crossbolt engaging portion thereof from said crossbolt against bias of said spring means;

and means for moving said crossbolt into and out of locking engagement with said strike and including a spring yieldingly urging said crossbolt toward engagement with said strike, and a cam rotatably mounted in said housing and operative to move said crossbolt in a strike releasing direction against bias of said spring;

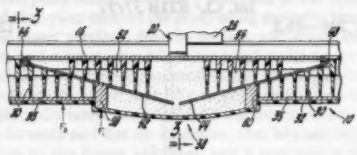
characterized by a recess defined by said crossbolt, a latch, latch mounting means mounting said latch in said housing for moving said latch in a direction transversely of the direction of movement of said crossbolt toward and away from reception of said latch in said recess, said latch being yieldingly biased toward said crossbolt, and a latch releasing element on said actuator lever engaging said latch mounting means for moving said latch out of said recess against the yielding bias applied thereto responsive to movement of said actuator lever toward holding engagement with said crossbolt.

4,061,384

BUMPER HAVING PIVOTAL LOAD SPREADER PLATE FOR DEFLECTING ENERGY ABSORBING MEDIUM

James R. Montgomery, Pendleton, and John S. Saczawa, Jr., Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1976, Ser. No. 681,534
Int. Cl.² B60R *19/08*
U.S. Cl. 293—71 R **3 Claims**



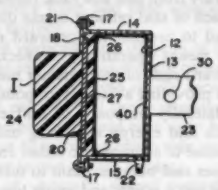
1. An energy absorbing bumper assembly for a vehicle comprising an elongated normally rigid bumper beam supported by a vehicle, deflectable energy absorbing media means mounted on said bumper beam and extending longitudinally thereof a predetermined distance less than the length of said bumper beam and projecting outwardly therefrom, said media means being a wedge shaped block having an inner planar back surface supported on said bumper beam and having an outer planar front surface extending at a predetermined angle with respect to said back surface, a flat load spreader plate aligned with said bumper beam, said plate being of a substantially rigid material disposed along and parallel to the entire front surface of said block and extending at one end beyond the same to a position closely adjacent the bumper beam, means pivotally connecting said one end of said load spreader plate directly to said rigid bumper beam for limited turning movement about a fixed axis of rotation towards said bumper beam in response to an impact load applied to the spreader plate so that the load spreader plate functions as a lever arm to simultaneously deflect the forward portion of the energy absorbing block to increase the energy absorption efficiency thereof and a flexible plastic facia attached to said bumper beam for covering said bumper beam, said load spreader plate and said energy absorbing block.

4,061,385

IMPACT ABSORBING BUMPER

Abraham Schwartzberg, 2931 Sunrise Lakes Drive East Sunrise,, Fort Lauderdale, Fla. 33322

Continuation-in-part of Ser. No. 627,234, Nov. 17, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 738,226
Int. Cl.² B60R *19/10*
U.S. Cl. 293—71 P **2 Claims**



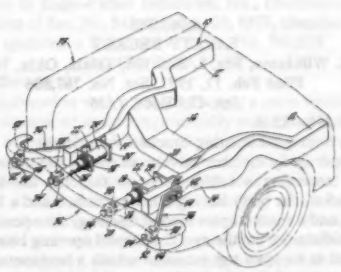
1. An impact absorbing bumper comprising a housing having a front wall, a rear wall, side wall means joining said front and rear walls forming a chamber, said front wall having an opening, substantially resilient impact receiving means extending through said opening, said impact receiving means having an impact receiving portion of substantially the same cross sectional area as said opening positioned outwardly of said front wall to permit the sliding movement of said impact receiving means, a substantially resilient flat wall portion slidably mounted in said chamber and engaging said side wall means, said flat wall portion being substantially larger in cross sectional area than said opening, a plate member mounted in said flat wall portion in said chamber at substantially said opening and between said impact receiving portion and said flat wall portion, a resilient tube positioned in said chamber, said tube having valve means extending through said housing and acting as an inlet for air under pressure into said tube, said tube engaging said side wall means, said rear wall and said resilient flat wall portion whereby impacts received by said resilient impact receiving means is transmitted to said plate member and said resilient flat wall portion to compress said resilient tube as said impact receiving means, said flat wall portion and said plate member are slid inwardly of said chamber and support means secured to said housing for mounting said bumper.

4,061,386

ENERGY MANAGING BUMPER SYSTEM FOR VEHICLES

Ronald Chupick, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1975, Ser. No. 632,187
Int. Cl.² B60R *19/02*
U.S. Cl. 293—86 **3 Claims**



1. An energy managing bumper system for a vehicle having a frame with a pair of laterally spaced longitudinally extending side rails, said system comprising an elongated normally rigid

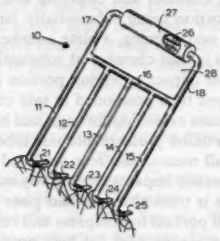
bumper beam extending laterally across one end of said side rails of said vehicle, a pair of energy absorbing units laterally spaced from each other and yieldable in response to the application of a predetermined impact thereto, said energy absorbing units straddling the center line of the vehicle and operably and directly connecting said bumper beam to said side rails of said vehicle for movement between an extended and a retracted position with respect to said vehicle, a pair of retainer means disposed outboard of said energy absorbing unit and extending forwardly from said side rails, fastener means attaching one end of each of said retainer means directly to a corresponding side rail to prevent the outward movement therefrom, connector means operatively connecting said bumper beam to the forward ends of said retainer means, each of said connector means providing a fixed pivot point for said bumper beam disposed laterally outboard of said energy absorbing units so that each said energy absorbing unit is immediately activated in response to an impact to either end of said bumper beam which causes said bumper beam to turn with respect to either one of said pivot points and move toward the vehicle.

4,061,387

NET-RAISING TOOL

Jon M. Lindbergh, Bainbridge Island, Wash., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 1, 1976, Ser. No. 719,465
Int. Cl.² B65G *7/12*
U.S. Cl. 294—26 **7 Claims**



1. A net-raising tool for use in raising a fish net having meshes and laden with fish, comprising

a series of several dull-ended, constant-diameter net-engaging members about one-quarter inch in diameter located in line along substantially a common plane, for exerting an even strain on the net at a corresponding series of meshes,

support means joining said net-engaging members together, and

handle means joined to said support means and spaced from it so as to provide a hand-receiving and hand-protecting opening well spaced from said net-engaging members.

4,061,388

SAFETY BECKET

Alvin H. Wilkinson, Rte. 1, Box 106, Talala, Okla. 74080

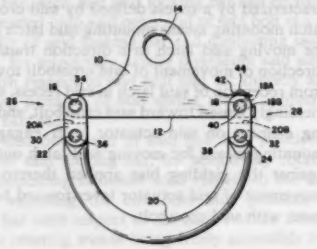
Filed Feb. 11, 1977, Ser. No. 767,806
Int. Cl.² B66C *1/36*
U.S. Cl. 294—82 R **2 Claims**

1. An improved hoisting bracket comprising:

an upper body member having an eye in the upper portion for receiving a cable, hook or the like for lifting the bracket, the body having a lower surface and a first opening and a spaced apart second opening, the openings being equidistant from the eye, the second opening being configured as an open top recess in which a horizontal pin may be received therein by downward and lateral movement towards the first opening;

a lower U-shaped shank member having first and second ends in a common plane and having a first opening adjacent the first end and a second opening adjacent the second end, the spacing between the openings in the shank being substantially equal to the spacing between the openings in said body;

first and second links, each having paralleled vertical side plates and paralleled horizontal upper and lower pins, the upper pin of the first link being received in said first body opening and the lower pin in said first shank opening whereby said shank is pivotally attached at the first end to



said body and the lower pin of the second link being received in said second shank opening whereby the second link is pivotally supported to the second end of said shank, the upper pin of the second link being slidably positionable into and out of said body second opening when said shank is moved upwardly towards said body and simultaneously laterally in the direction towards said second body opening.

4,061,389

COMBINATION WIRE LINE RELEASABLE OVERSHOT AND PULL TOOL

V. J. Keller, P.O. Box 847, Channelview, Tex. 77530, and William T. Taylor, 222 Camp Lilly Road, Humble, Tex. 77338

Filed July 9, 1975, Ser. No. 594,330
Int. Cl.² E21B *31/12*
U.S. Cl. 294—86.3 **13 Claims**

1. A releasable down hole tool operable on a wireline, comprising

an elongate tubular body adapted to run in a well bore;

an out mandrel slidably positioned about said body;

a connective tool for achieving a down hole operation on relative movement of said body and said mandrel;

a catch means operable on lengthwise movement and cooperative with said body and said body and said mandrel to

selectively and releasably repetitively secure said body and said mandrel in first and second relative movement to said connective tool which further operates repetitively between the first and second relative lengthwise positions, each operation occurring on lengthwise movement of said tool and wherein said catch means comprises

1. a groove means formed in said body;
2. a pin carried on said mandrel and captured in said groove means for movement confined therein;
3. wherein said groove means is constructed and arranged in a closed loop enabling repetitive movement as said pin traverses said closed loop; and
4. including means for limiting movement of the pin in said closed loop groove means to traversing said closed loop groove means in a single direction.

4,061,390

ELEVATING ASSEMBLY FOR THE UPPER PLATFORM OF A ROAD TRANSPORT VEHICLE CARRIER

Roger Schall, Kirchheim, France, assignor to Lohr-Construction de Vehicules Industriels S.A., Hangenbieten, France

Filed July 8, 1976, Ser. No. 703,700
Claims priority, application France, July 8, 1975, 75.22906
Int. Cl.² B60P *3/08*
U.S. Cl. 296—1 A **4 Claims**

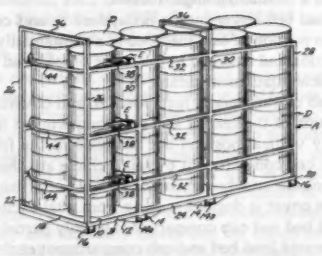
1. In a road transport vehicle carrier having a lower platform and an upper platform and support posts extending from the lower platform to support the upper platform at such a height that vehicles can be accommodated on both platforms when vehicles are being transported on the carrier, the upper ends of the posts being pivotally connected to the upper platform and the lower ends of the posts being movable lengthwise along the lower platform thereby to raise and lower the upper platform, and a strut pivotally connected at its upper end to each post and pivotally connected to the lower platform at a distance from its upper end; the improvement in which the strut is pivotally interconnected with the lower platform intermediate its ends and has an extension arm beyond its pivotal connection to the lower platform, and a ram acting between said extension arm and the lower platform to raise and lower the upper platform.

4,061,391

DRUM SUPPORTING CARRIAGE

Theodore T. Violette, 2603 Wall St., Long Beach, Calif. 90804

Filed Sept. 7, 1976, Ser. No. 720,755
Int. Cl.² B60P *7/00*
U.S. Cl. 296—4 **7 Claims**



1. A fork lift engageable carriage on which a plurality of stacks of cylindrical drums are removably disposed to permit said carriage and drums to be transported as a unitized assembly, whcih fork lift engageable carriage includes:

a. a flat rectangular rigid base that has an upper surface and a bottom surface, first and second ends, and first and second sides;

b. transverse fork lift engageable means secured to said bottom surface;

c. first and second pairs of transversely spaced uprights that extend upwardly from said base adjacent said first and second ends thereof;

d. a plurality of vertically spaced pairs of first drum-retaining strips that extend longitudinally between said first and second pairs of uprights and rigidly secured thereto with each of said pairs of first drum-retaining strips being so vertically spaced above said base as to be adjacently disposed relative to an intermediate side wall section of one of said drums in one of said stacks;

e. a plurality of vertically spaced second drum-retaining strips that extend transversely between said second pair of uprights secured thereto with each of said second drum-retaining strips being so vertically spaced above said base as to be in contact with intermediate side wall sections of said drums most adjacently disposed relative thereto;

f. a plurality of vertically spaced elongate members that have first and second ends with said first ends being disposed in fixed positions relative to said first upright most adjacent to said first side of said base, said members being so vertically spaced that they contact intermediate wall sections of said drums in said stocks most adjacent said first end of said base when said members are transversely disposed; and

g. a plurality of vertically spaced first means disposed in fixed positions relative to said first upright most adjacent said second side of said base, with each of said first means being capable of removably engaging one of said second ends of said members, with each of said first means when actuated, tensioning the one of said members associated therewith, with each of said members when tensioned pressure contacting said drums in said stacks most adjacent thereto to tend to force said drums towards said second pair of uprights, and said drums as they tend to move towards said second pair of uprights tending to move said drums situated intermediate therebetween towards said second pair of uprights, and with said drums being forced into pressure contact with one of said pairs of first drum-retaining strips and one of said second retaining strip to be gripped therebetween in a fixed position relative to said base to permit said unitized assembly to be transported to a desired destination.

4,061,392

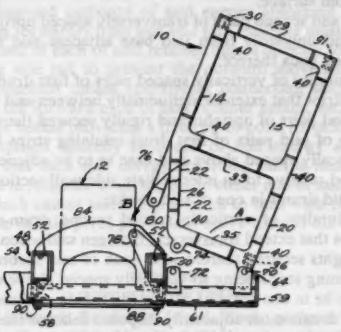
SIDE TILT INTEGRATED CAB

James E. Lowder, and Gary D. Perry, both of Lubbock, Tex., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Continuation of Ser. No. 542,405, Jan. 20, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,629
Int. Cl.² B62D *27/00*
U.S. Cl. 296—28 C **1 Claim**

1. In combination with a vehicle having a main frame which includes two spaced-apart longitudinally extending main frame members, an operator cab frame constructed of posts and cross members connected together to form a rigid cage having an interior space, an operator seat inside said cage and rigidly connected to said cab frame, and mounting means interconnected to said cab frame and to said vehicle frame for normally holding said cab frame in a fixed position and for preferentially absorbing energy by plastic deformation when lateral forces are applied to said cab frame in a direction tending to swing said cab frame relative to said main frame in the event of roll-over of the vehicle, whereby said cab frame remains intact and plastically undeformed during roll-over, said mounting means including two transverse beams both secured to at least

one of said main frame members and extending laterally thereof so as to support said cab frame from below in a position outboard of said main frame, and connecting means connecting said cab frame to said beams at locations near the outer ends of said beams and a plastically deformable compression post extending downwardly from said cab frame and pivotally



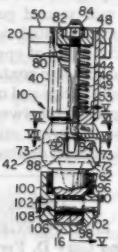
connecting with said main frame at a location which is spaced rearwardly from both of said beams, said main frame including at said location a transverse frame member rigidly connected to both of said main frame members, said post and said transverse beams being preferentially plastically deformable relative to said posts and cross members which form said cab frame.

4,061,393

SHOCK MOUNTED TILTING OPERATOR PLATFORM

Gary D. Blomstrom, Waverly, Nebr., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 15, 1975, Ser. No. 640,514
Int. Cl.² B62D 27/04
U.S. Cl. 296—28 C **1 Claim**



1. An assembly for mounting an operator's cab to the frame of a vehicle, comprising:

a first connector having a rigid load bearing surface at a free end thereof;

a second connector having a rigid load bearing surface for mating supportive load bearing engagement with the bearing surface of the first connector;

means for releasably locking together the first and second connectors when in supportive load bearing engagement with one another;

means for securing the first connector to one of the cab and the frame, and

means spaced from the rigid load bearing surfaces and the locking means for resiliently mounting the second connector to the other of the cab and the frame, said resilient mounting means isolating the cab from frame vibrations;

said second connector having an elogate body with the load bearing surface at one of a pair of opposite end portions thereof, and

said resilient mounting means including

a resilient bushing within a bore extending through the body adjacent the other end portion thereof, and

a pin supported by the frame and extending through the bushing, said frame having a recess therein for receipt of the other end portion of the body and said pin extending across the recess between opposite sides thereof;

said frame having a hole overlying and communicating with the recess defining a shoulder therebetween,

said body having a section above the other end portion defining a shoulder therebetween and received within the hole when the other end portion is within the recess, and

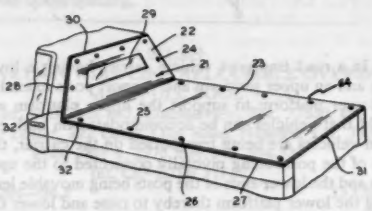
said resilient mounting means including a bushing within the hole surrounding said section and resiliently isolating it from frame vibrations in a plane parallel to the pin, said pin supporting the shoulders in spaced relation.

4,061,394

TONNEAU COVER FOR RECREATIONAL VEHICLE

George M. Vodin, 2280 Hassell Road, Hoffman Estates, Ill. 60195

Filed Jan. 12, 1976, Ser. No. 648,488
Int. Cl.² B60P 7/04
U.S. Cl. 296—100 **10 Claims**



1. A tonneau cover for recreational vehicles comprising:

load bed cover means of substantially pliable weather-resistant material for enclosing an open load bed having a peripheral frame;

cab closure means of substantially pliable weather-resistant material which emanates from a first end of said load bed cover means, for closing off the rear opening of a vehicle cab compartment;

vehicle attachment means for affixing said load bed cover means over the top of said load bed of said vehicle and for affixing said cab closure means over said rear opening of said vehicle cab compartment respectively;

said load bed cover means and said cab closure means meeting at the intersection of said load bed and cab so as to form a substantial angle thereat;

said load bed cover means juxtaposed to and covering the open portion of said load bed in a substantially horizontal position and attached to the frame of said load bed by said vehicle attachment means;

said cab closure means juxtaposed to and covering the open portion of the rear of said cab compartment in a substantially vertical position and attached to the frame of said rear cab compartment by said vehicle attachment means;

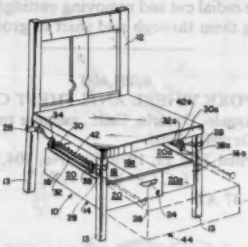
said vehicle attachment means capable of affixing said tonneau cover in degrees ranging from total enclosure of said load bed and cab compartment to only partial attachment over said load bed and cab compartment enclosing only a desired portion of said bed and cab compartment respectively.

4,061,395

PORTABLE DRAWER ASSEMBLY

Leon J. Boole, P.O. Box 31, Newtonville, Mass. 02160

Filed Oct. 13, 1976, Ser. No. 732,283
Int. Cl.[2] A47C 7/62
U.S. Cl. 297—192 3 Claims



1. A portable drawer assembly for use with a four legged piece of furniture having a space between the legs, such as a chair or the like, said assembly comprising:

a. an enclosure having an open top and means for selectively adjusting the width thereof to effect the positioning thereof in the space between the four legs, said enclosure including first and second unitary sections each having a rectangular base and three side walls perpendicular thereto, said adjusting means including an integral slot in the base and two side walls of said first section along the open side thereof, the base and two side walls of said second section at the open side thereof being configured to be entirely slidably received in said integral slot; and

b. means for moveably mounting the enclosure in suspension from the four legs for sliding movement of the enclosure into and out of said space between the four legs, a set screw in one of said two side walls of said first section for engaging the corresponding side wall of said second section to maintain the two sections in a selected position corresponding to a desired width, said mounting means comprising four clamping members for connecting to the four legs, two first elongated rods each connected between two clamping members along the length of the enclosure, two second elongated rods connected at two sides of the top of the enclosure along the length thereof and two sets of first and second connecting members, each set disposed at one side of the enclosure and suspending the same therefrom and wherein the first connecting member of each set is fixedly connected to one first rod and slidably connected to one second rod at the front of the enclosure and the second connecting member of each set is fixedly connected to one second rod and slidably connected to one first rod at the rear of the enclosure.

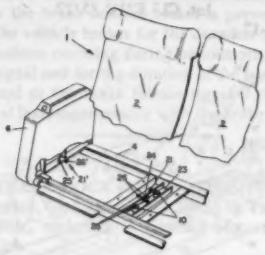
4,061,396

TIE DOWN FOR ROTATING SEAT CUSHIONS

William D. Reida, Green Mountain Falls, Colo., assignor to AMI Industries, Inc., Colorado Springs, Colo.

Filed Feb. 24, 1976, Ser. No. 660,845
Int. Cl.[2] A47C 27/00
U.S. Cl. 297—283 2 Claims

1. A seat comprising multiple seat and back frames, upholstered seat and back cushions arranged on said frames, said seat cushions having upper and lower seating surfaces, tie-down tabs swivelly attached at their upper ends to the sides of said seat cushions substantially centermost thereof and depending below one of said seating surfaces, apertures in the depending ends of said tabs, hook means fixedly anchored in said seat frame adjacent the outer sides of said seat cushions and projecting upwardly and angularly therefrom, ear means on the free ends of said hook means, said ears being interengaged with said tab apertures, and generally U-shaped hook means with upwardly and angularly projecting arms extending at an angle of approximately 45 degrees and anchored to said frame between the adjoining sides of said seat cushions, and ears formed on the upper free ends of said arms for interengagement with said adjoining cushion tabs, and the ear means on the free ends of



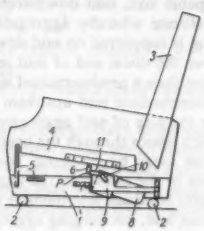
said hook means so interengages with said apertures in the tabs on adjoining sides of said cushions whereby both cushions are attached thereto and downward pressure exerted thereon to properly seat said cushions in said frames and prevent forward sliding movement thereof.

4,061,397

DRIVE MECHANISM FOR RECLINING CHAIRS

Michael Roland Lewis, 72 Pole Hill Road, Uxbridge, Middlesex, England

Filed Mar. 8, 1976, Ser. No. 665,145
Claims priority, application United Kingdom, Mar. 11, 1975, 9998/75
Int. Cl.[2] A47C 1/02
U.S. Cl. 297—330 8 Claims



1. A drive mechanism for a reclining chair or the like comprising:

an electric motor mounted on a chair frame;

manually operable switch means for selectively supplying electric power to said motor;

a shaft driven by said motor;

a crank lever attached to said shaft;

a bracket;

flexible means for attaching said bracket to a seat of the chair;

said flexible means comprising an elongate member extending transversely across the underside of the seat;

said elongate member having its ends attached to the seat;

a portion of said bracket being fixedly attached to a central part of said elongate member;

a link member having one end pivotally connected to said crank lever such that the locus of movement of the pivot point is circular and having its other end pivotally connected to another portion of said bracket;

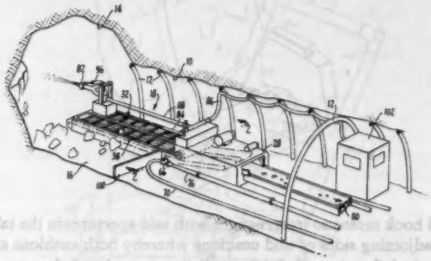
said bracket and said elongate member being movable in both a horizontal and a vertical direction, whereby said seat is movable over a substantially horizontal first arc and a substantially vertical second arc.

4,061,398

HYDRAULIC MINING APPARATUS AND METHOD

David M. Parkes, Calgary, Canada, assignor to Kaiser Resources Ltd., Canada

Filed July 2, 1976, Ser. No. 702,072
Claims priority, application Canada, Apr. 6, 1976, 246968
Int. Cl.[2] E21C 35/22
U.S. Cl. 299—17 8 Claims



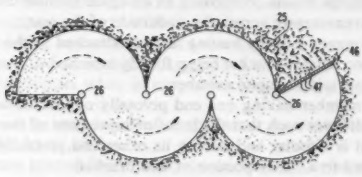
7. A method of treating and conveying hydraulically mined aggregate, said method comprising: conveying said aggregate over an elongate perforate continuous loop belt conveyor having upstream and downstream sections and a reach extending over the length of said sections, the belt of said conveyor being sufficiently open to permit the substantially unrestricted passage of mined aggregate therethrough and having an upstream support extending beneath said reach over the length of said upstream section and a downstream support extending beneath said reach over the length of said downstream section, said upstream support having openings therein sized to permit fluid and aggregate of a pumpable size to pass therethrough while preventing the passage therethrough of aggregate greater than pumpable size, said downstream support being substantially imperforate whereby aggregate carried by said downstream section is supported on said downstream support and discharges over the distal end of said section; subjecting aggregate of greater than a predetermined size to breakage at a point disposed intermediate said upstream and downstream sections to reduce the size of said aggregate; collecting fluid and aggregate which passes through the upstream support and conveying the same away by pumping; conveying over the downstream section of the conveyor the aggregate remaining on the conveyor after breakage intermediate said upstream and downstream sections; and, discharging aggregate conveyed on said downstream section over the distal end thereof onto a conveyor disposed in receiving relationship to said downstream section.

4,061,399

MINING BY INSERTION OF CUTTING MODULES INTO SHAFT FOR CONNECTION AND ACTUATION

Rodney L. Nelson, Falls Creek, Pa., assignor to Ray M. Baughman, DuBois, Pa., a part interest

Filed Mar. 5, 1976, Ser. No. 664,191
Int. Cl.[2] E21C 41/00
U.S. Cl. 299—18 12 Claims



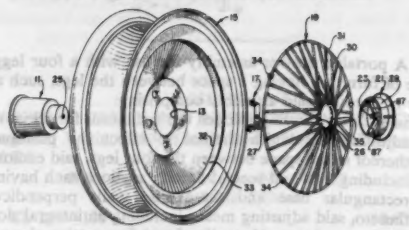
1. A method of mining coal, minerals and other minable materials beneath the surface of the earth comprising forming a shaft from ground level downwardly to intersect a subterranean seam, assembling a string of interconnected mining modules in the seam by cutting substantially radially into said seam and away from said shaft by a lead module and removing cuttings from said seam and delivering them through said shaft to ground level, and further cutting into said seam on a second path by said string of interconnected mining modules along one side of the radial cut and removing cuttings from said seam and delivering them through said shaft to ground level.

4,061,400

SPOKE WHEEL ANTI-THEFT CLIP

Robert A. D'Angelo, Ontario, Calif., assignor to Keystone Products, Inc., Ontario, Calif.

Filed July 12, 1976, Ser. No. 704,153
Int. Cl.[2] B60B 7/00
U.S. Cl. 301—37 AT 3 Claims



1. Apparatus for preventing theft of a spoke assembly from a wheel, comprising:

a spoke assembly including plural radiating spokes and means preventing relative rotation between said spoke assembly and said wheel;

a locking member attached to said spoke assembly to prevent rotation of said locking member relative said spoke assembly;

said locking member being unitarily formed of resilient metal and comprising a base, a resilient finger extending from said base, said finger being an integral part of said locking member, and an extending section of said finger ending in a stub which may be depressed to lower said finger towards its base; and

a threaded fastener clamping said spoke assembly to said wheel, said threaded fastener including a projection selectively engaging said finger when said finger is in its relaxed position, said projection spaced sufficiently from said locking member to not engage said finger when said finger is resiliently bent toward said base.

4,061,401

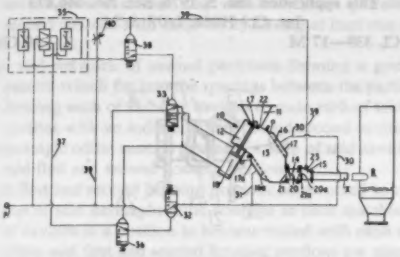
PNEUMATICALLY OPERATED CONVEYOR SYSTEMS FOR PULVERULENT OR PARTICULATE MATERIALS

Roy William Brown, 29 Fairwater Road, Llandaff, Cardiff, Glamorganshire, Wales

Filed Dec. 23, 1975, Ser. No. 643,907
Claims priority, application United Kingdom, Jan. 8, 1975, 744/75
Int. Cl.[2] B65G 53/66
U.S. Cl. 302—41 9 Claims

1. A high frequency pneumatic conveying system for pulverulent or particulate material comprising a despatch vessel, a conveying pipe line being connected to said despatch vessel for connecting said despatch vessel with a receiving vessel, a piston and cylinder operated fill valve being mounted in said despatch vessel for admitting material to be conveyed into said despatch vessel, and control means for alternately operating said fill valve and applying pressure air to said despatch vessel for intermittently discharging material in the despatch vessel into said pipe line, said despatch vessel having a non-return

outlet valve, air vents in said despatch vessel in the form of permeable low resistance membranes which in one mode of operation permit rapid filling of said despatch vessel by rapid venting of air therefrom and in another mode of operation act

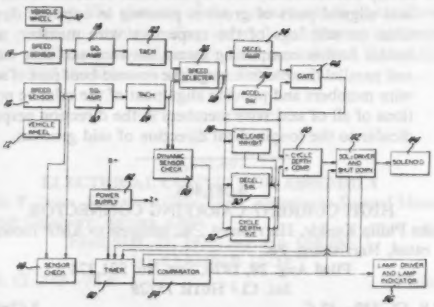


as fluidizers for material in the despatch vessel, a control means for ensuring a firm closure of said fill valve before conveying air is admitted to said despatch vessel, and means to regulate said despatch of material in accordance with the air pressure in said conveying pipe line.

4,061,402
WHEEL LOCK CONTROL SYSTEM FAILURE AND DISABLING CIRCUIT

Philip R. Peterson, Grand Blanc; David W. Taylor, Davison, and Wayne A. Levijoki, Clio, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 29, 1976, Ser. No. 727,943
Int. Cl.² B60T 8/02
U.S. Cl. 303—92 **3 Claims**



1. A wheel lock control system for a vehicle having rotatable wheels and a braking system for applying braking forces to the wheels and including a system failure monitoring and disabling circuit, the system comprising:

speed sensing means effective to provide a wheel speed signal representing wheel rotational speed;

control circuit means responsive to the wheel speed signal effective to provide a brake release signal when the wheel speed signal characteristics represent an incipient wheel lock condition;

brake control means responsive to the brake release signal effective to release the braking forces on the wheels for the duration of the brake release signal; and

a monitoring circuit, the monitoring circuit including

means effective to generate a fault signal in response to a sensed system malfunction,

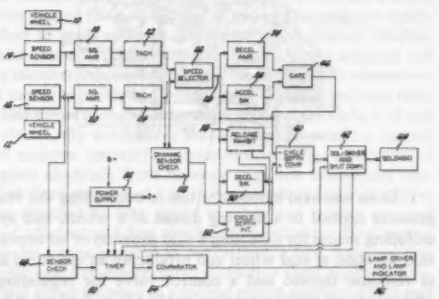
logic means responsive to the fault signal and the brake release signal effective to provide an inhibit signal which is initiated solely by the fault signal and terminated only when both the fault and brake release signals are terminated so that the inhibit signal exists only for the duration of a temporary fault occurring during time periods other than during a brake release signal and exists for the duration of the longer one of the fault signal or a brake release signal if the fault signal coexists at least momentarily with the brake release signal, and

means reponsive to the inhibit signal effective to inhibit the brake control means response to the brake release signal, whereby the brake control means is prevented from releasing the vehicle brakes for the duration of a temporary fault condition occuring during periods other than a brake release signal and for the duration of the longer one of the fault signal or the brake release signal if the fault signal coexists at least momentarily with the brake release signal.

4,061,403
WHEEL LOCK CONTROL SYSTEM

Philip R. Peterson, Grand Blanc, and David W. Taylor, Davison, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 29, 1976, Ser. No. 727,942
Int. Cl.² B60T 8/02
U.S. Cl. 303—106 **4 Claims**



1. A wheel lock control system for a vehicle with braked wheels comprising:

means effective to provide a speed signal representing wheel speed;

a deceleration switch responsive to the speed signal effective to provide a control signal which is initiated when the rate of change of wheel speed exceeds a predetermined threshold deceleration indicative of incipient wheel lock;

a cycle depth integrator effective to generate a cycle depth signal; and

control means responsive to the control signal and the cycle depth signal for effecting brake release during the period of the control signal and during the time period the cycle depth signal exceeds a reference value,

the cycle depth integrator including; means responsive to the speed signal effective to provide an acceleration signal representing wheel acceleration,

means effective during brake application to provide a deceleration reference signal representing a maximum vehicle deceleration, the deceleration reference signal being terminated during brake release,

integrating means effective to integrate the sum of the acceleration signal and the deceleration reference signal to provide the cycle depth signal, the cycle depth signal being a composite signal comprises of a first porion representing the amount that the time integral of the deceleration reference signal exceeds the wheel speed during brake application and a second portion which is the integral of wheel acceleration during brake release, and

means responsive to brake reapplication effective to set the cycle depth signal output of the integrating means to a value equal to the value the cycle depth signal would have obtained if the deceleration reference signal were continually summed with the acceleration signal, the cycle depth signal having a magnitude that increases to a value greater

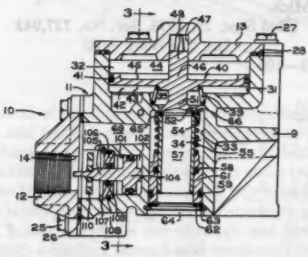
than the reference value after repeated brake release and application cycles when the average wheel deceleration exceeds the maximum possible vehicle deceleration representing the wheel approaching a locked condition to maintain the wheel brake released to allow the wheel to accelerate toward vehicle speed to thereby prevent wheel lock.

4,061,404

BRAKE PRESSURE CONTROL VALVE

Charles Hunter Lantz, Troy, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 6, 1976, Ser. No. 747,680
Int. Cl.[2] B60T 8/06
U.S. Cl. 303—118 4 Claims



1. In an anti-skid system for use in controlling the braking pressure applied to a braking means of a wheel, said system including means for detecting a skid situation or an impending skid situation at said wheel and producing an electrical signal in response thereto and a control valve for regulating the amount of said braking pressure applied to said wheel, wherein said control valve comprises:

a valve housng having a balancing piston chamber, a baffle piston chamber, an inlet opening for braking fluid, said braking fluid inlet opening adjacent said baffle piston chamber, and an inlet opening for modulating fluid;

a balancing piston movable within said balancing piston chamber and having two opposing surfaces, each of said surfaces adaped to be exposed to a pressurized fluid which biases said balancing piston, and a baffle piston movable within said baffle piston chamber and adapted to be exposed to a pressurized fluid within said baffle piston chamber which biases said baffle piston;

a braking fluid chamber having a boundary which comprises one of said opposing surfaces of said balancing piston, a braking fluid passageway from said braking fluid inlet opening to said braking fluid chamber, and a braking fluid communication means between said braking fluid chamber and said braking means;

a modulating fluid chamber having a boundary which comprises the other of said opposing surfaces of said balancing piston, a first modulating fluid passageway between said modulating fluid chamber and said modulating fluid inlet opening, and a second modulating fluid passageway between said first modulating fluid passageway and said baffle piston chamber;

a solenoid valve assembly operative in response to said electrical signal to divert said modulating fluid from said first modulating fluid passageway through said second modulating fluid passageway to said baffle piston chamber, and

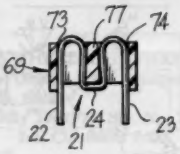
a baffle movable in response to said movement of said baffle piston, said baffle adapted to partially block said braking fluid inlet opening thereby partially restricting the flow of said braking fluid through said braking fluid passageway.

4,061,405

APPARATUS FOR HANDLING CONNECTORS

Jerry B. Minter, Normandy Heights Road, Morristown, N.J. 07960

Division of Ser. No. 504,233, Sept. 9, 1974, Pat. No. 3,940,849.
This application Jan. 5, 1976, Ser. No. 646,473
Int. Cl.[2] H05K 1/07, 3/34
U.S. Cl. 339—17 M 10 Claims



1. An article of manufacture comprising a plurality of resilient wire connector members, each formed of an integral piece of wire bent to comprise a pair of legs extending generally parallel to each other and an integral, reverse-bent part joining said legs together at one end thereof, the other end of each of said legs being free; and

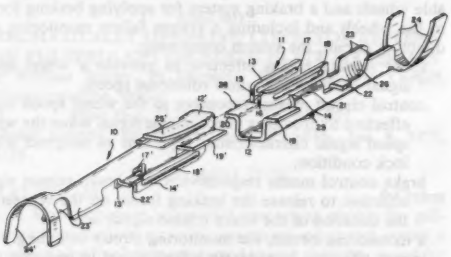
a holder for a plurality of said wire members and comprising: a body portion comprising a pair of substantially parallel side walls having surfaces facing toward each other, each of said walls having parallel grooves in the facing surface thereof aligned with corresponding ones of said grooves in the facing surface of the other of said walls to comprise an aligned pair of grooves, said walls being spaced apart by a distance slightly less than the normal distance across said pair of legs to the outermost part of the surfaces of said legs, each of said wire members being firmly but releasably held by the inner surfaces of one of said aligned pairs of grooves pressing in opposite directions on said legs of the respective wire member, said holder further comprising means between said side walls and parallel thereto to engage the reverse-bent part of said wire members and provide alignment of the relative positions of all of said wire members in the direction perpendicular to the longitudinal direction of said grooves.

4,061,406

HIGH CURRENT CARRYING CONNECTOR

John Philip Kunkle, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 28, 1974, Ser. No. 501,374
Int. Cl.[2] H01R 13/28
U.S. Cl. 339—47 C 3 Claims



1. A connector comprising:

a first housing portion comprising a first common base and a first network of partitions supported on said common base which define a plurality of first cavities thereon with each first cavity having at least one adjacent cavity;

those partitions defining each first cavity being separated

from those partitions defining adjacent cavities by a spacing therebetween;

a second housing portion matable with said first housing portion and comprising a second common base and a newtork of second partitions which are supported on said second common base and which define a plurality of second cavities with each cavity having at least one adjacent cavity;

the said network of second partitions forming a grid-like pattern which fits into the spacings between the partitions forming each of said first cavities to mate each of said first cavities with an individual one of said second cavities;

a hermaphroditic contact retained in each of said cavities of said first and second housing portions;

said first and second housing portions constructed to retain one of said hermaphroditic contacts in each matable pair of cavities in a position to become mated with each other when said first and second housing portions are mated;

each of said matable contacts comprising:

a trough-like element at one end of said contact;

a pair of elongated, leaf-like elements mounted upon said trough-like element;

and means for retaining a conductor of another end of said contact;

said pair of elongated, leaf-like elements of each contact of each pair of matable contacts being constructed to fit within the trough-like element of the other contact of said matable pair of contacts to provide four separate areas of electrical contact between the four leaf-like elements and the two trough-like elements of a mating pair of said matable contacts;

each of said matable contacts further comprises an embossed area on each of said elongated leaf-like elements;

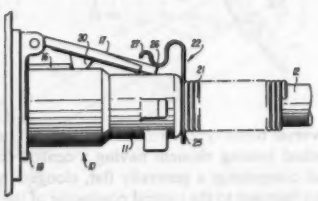
said embossed areas being positioned on said leaf-like elements to make contact with the inner surface of the trough-like element of the contact which mates therewith to enable cooling air to flow between said inner surfaces and said trough-like element and the mating leaf-like elements adjacent thereto.

4,061,407

ELECTRICAL CONNECTOR ASSEMBLY

John P. Snow, Sagamore Hills, Ohio, assignor to Samuel Moore and Company, Aurora, Ohio

Filed Mar. 18, 1976, Ser. No. 668,263
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 P **7 Claims**



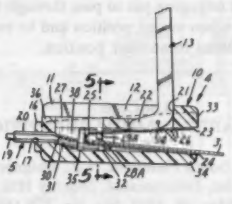
1. An electrical connector assembly comprising a receptacle having an open end, a plug and cable assembly, said plug being inserted in the receptacle and making electrical contact therewith, an exposed protuberant member on the plug, a cover hinged to the receptacle and biased towards said open end, a latch depending from the cover and disposed against the exposed end of said protuberant member, and a one-piece spring clip member having a body portion secured to the said assembly and having an integral U-shaped resilient portion biasing the cover against the plug.

4,061,408

CONNECTOR FOR A PLATE ELECTRODE

Kenneth D. Bast, St. Paul, and Jerauld M. Kennelly, Mahtomedi, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 7, 1976, Ser. No. 720,743
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—75 R **10 Claims**



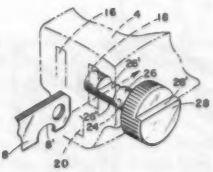
1. A connector for a plate electrode comprising in combination a resilient body comprising an upper member and a lower member spaced from each other at one end thereof and rigidly attached to each other at the opposite end thereof; flexible, resilient first electrically conductive sheet means adjacent said upper member, means holding said first electrically conductive sheet means between said upper and lower members and adjacent said upper member, at least a portion of the surface of said first electrically conductive sheet means nonadjacent to said upper member containing means for resisting movement of said plate electrode from between said first electrically conductive sheet means and said lower member, a pivoting lever means attached to said upper member and having one end thereof adjacent said first electrically conductive sheet means, said lever means adapted to move from a first open position whereby said first electrically conductive sheet means is adjacent said upper member to a second closed position where said first electrically conductive sheet means is deflected to be adjacent said lower member with said plate electrode held between said first electrically conductive sheet means and said lower member and said plate electrode contacting the surface of said first electrically conductive sheet means containing means for resisting movement of said plate electrode from between said first electrically conductive sheet means and said lower member, and second electrically conductive means attached to said first electrically conductive sheet means for electrically connecting said first electrically conductive sheet means to an electrical power source.

4,061,409

RELEASABLE LOCKING MEANS FOR TWO PART ELECTRIC CONNECTOR

Herbert Shipley Bealmear, Ridge Road, Box 8C, Hanover, Md. 21076

Filed Nov. 10, 1976, Ser. No. 740,560
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 P **1 Claim**



1. An electric connector of two separate body members with matching end faces, one of said members having a plurality of electric carrying elements extending outwardly from the

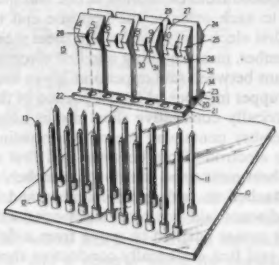
matching face thereof, and the other body member having a plurality of recesses extending inwardly from the matching face of the second body member for receiving the extensions of the first body member, a cut-away portion formed in at least one of the extended elements for engaging a locking means carried by the second body member, the locking means comprising a rotatable locking pin mounted in an aperture in the second body member, said pin having a cut-away portion within at least one side thereof to allow the extended element carried by the lock engaging pin to pass through the cut-away portion of the pin when in one position and to engage the pin when the pin is rotated to another position.

4,061,410

CIRCUIT BOARD TERMINAL IDENTIFICATION DEVICE

Peter Steve Kubik, South Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 18, 1977, Ser. No. 779,160
Int. Cl.[2] H01R *3/00*
U.S. Cl. 339—113 B **7 Claims**



1. Apparatus for facilitating identification of parallel rows of interconnection pins on a circuit board including

a base portion,

means, integral with said base portion, for securing said apparatus to said parallel rows of interconnection pins,

identifier means, and

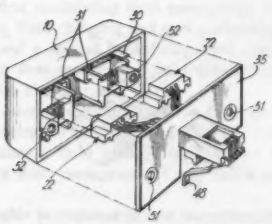
means for flexibly mounting said identifier means to said base portion.

4,061,411

MULTI-OUTLET ADAPTOR FOR PLUG-IN TELEPHONES

Beverley William Gumb; Gerd Kuhfus, and Fredrick Thomas Cogan, all of London, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jan. 21, 1977, Ser. No. 761,066
Int. Cl.[2] H01R *27/02*
U.S. Cl. 339—159 R **4 Claims**



1. A multi-outlet adaptor for plug-in telephones, comprising:

a main part of hollow box-like form having a front, top and bottom, and ends;

at least two apertures in said front, said apertures each having a predetermined profile for reception of a plug therein;

a jack aligned with each aperture, said jacks on the inside of said front and each comprising a lower part integral with said front and an upper part positioned on said lower part, each lower part comprising two spaced apart side walls extending normal to said front and a bridge member at the rear of said side walls and extending between said side walls and integral therewith, and each upper part including two spaced apart parallel channels in an undersurface thereof, said channels slidable on said side walls of said lower part;

a retaining member on each end of the inside thereof and two further retaining members extending from the inside of said front, said retaining members extending over said side walls of said lower parts to retain said top parts of said jacks on said lower parts;

a back cover attached to said main part at the back thereof and a plug extending from said cover, in a direction away from said main part, said plug integral with said back cover; and

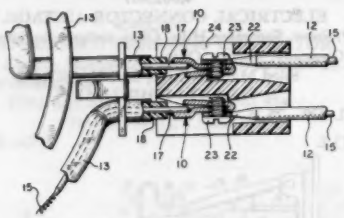
conductors in said plug and said jacks, the conductors in said jacks connected in parallel to said conductors in said plug.

4,061,412

TERMINAL FOR A RESISTANCE HEATING ELEMENT

Charles A. Skinner, Laurel, Md., assignor to Electro-Therm, Inc., Laurel, Md.

Filed Dec. 15, 1975, Ser. No. 636,475
Int. Cl.[2] H01R *11/26*
U.S. Cl. 339—263 R **5 Claims**

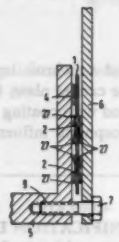


1. A universal blade-type terminal for use in conjunction with a sheathed heating element having a central conductor, said terminal comprising: a generally flat, elongate body portion for being fastened to the central conductor of the sheathed heating element at one end thereof and having a first aperture formed therein and sized to receive a first threaded fastener of one diameter; and a generally flat tab portion connected to the other end of said body portion by an arcuate neck portion of reduced width such that said tab portion extends under said body portion, said tab portion having a second aperture formed therein which is axially aligned with said first aperture and sized to receive a second threaded fastener having a different diameter than said first fastener, whereby said terminal is adaptable to receive one of at least two fasteners of different diameters.

4,061,413
GASKET FOR THE HIGH-FREQUENCY-TIGHT CONNECTION OF DETACHABLE METALLIC SHIELDING ELEMENTS

Roman Keller, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Oct. 2, 1975, Ser. No. 619,028
Claims priority, application Germany, Oct. 10, 1974, 2448421
Int. Cl.² H01R 11/20
U.S. Cl. 339—95 R 13 Claims



1. A gasket for use in realizing a high-frequency-tight connection between first and second detachable metallic shielding elements, said gasket having first and second exterior surfaces adapted to face said first and second elements, respectively, when said gasket is placed in the gap between said elements, said gasket comprising:

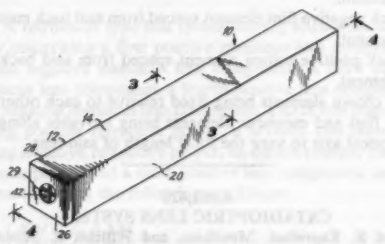
a strip of metallic material;

a multiplicity of triangular spring tabs arranged in at least one row approximately parallel to the long sides of said strip and projecting outwardly from said exterior surfaces, said tabs being disposed in said row individually in side by side relationship and such that the projections of adjacent tabs onto the plane of said strip are rotated by 180° relative to one another.

4,061,414
KALEIDOSCOPIC APPARATUS

Bruce D. Price, 924 W. End Ave., New York, N.Y. 10025

Filed Oct. 16, 1975, Ser. No. 623,024
Int. Cl.² G02B 27/08
U.S. Cl. 350—4 10 Claims



1. A kaleidoscopic apparatus comprising

an elongated substantially tubular housing,

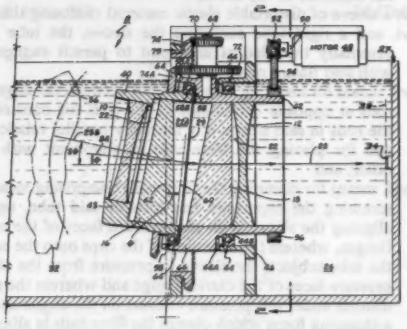
a plurality of planar members having reflective surfaces disposed internally within and extending longitudinally of said tubular housing and substantially dividing the entire cross-sectional interior thereof into predetermined geometric cross-sectional areas, and

said housing including front and rear wall members having first and second viewing apertures, respectively, formed therein.

4,061,415
NUTATING RADIATION DEFLECTING METHOD AND APPARATUS

Jon C. Taenzer, Palo Alto, Calif., assignor to Sanford Research Institute, Menlo Park, Calif.

Filed July 2, 1976, Ser. No. 702,273
Int. Cl.² G02B 27/17; G01V 1/16; H04B 13/02; G10K 11/00
U.S. Cl. 350—6 31 Claims



1. A deflection system for deflecting radiation subject to refraction, such as light or sound, comprising,

first and second radiation refracting wedges in the path of incident radiation through which wedges the radiation is passed,

means for mounting the second wedge for rotation about a fixed axis of rotation,

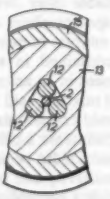
means for mounting the first wedge for rotation about a movable axis which nutates about said fixed axis during rotation of said second wedge, and

means for counterrotating said wedges at equal angular displacements for control of the deflection of said radiation passing therethrough.

4,061,416
OPTICAL FIBRE CONNECTOR

William James Stewart, Towcester, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Nov. 6, 1975, Ser. No. 629,570
Claims priority, application United Kingdom, Nov. 8, 1974, 48339/74
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 C 4 Claims



1. An optical fibre butt connector capable of establishing a disconnectable butt connection between two optical fibres of equal diameter comprising for each fibre:

i. an elastic bush means for supporting the fibre near an end of the fibre;

ii. a carrier disc means for carrying the bush means comprising a carrier disc connected to said bush means and having a flange extending parallel to the fibre towards the said end of the fibre and substantially perpendicular to the plane defined by the carrier disc, the flange terminating in a pressure face which is parallel to the plane of the carrier disc;

iii. and a cap having a bore means for receiving the fibre and through which the fibre gains access to the bush means, the cap including a seating means for receiving the carrier disc means and having an internally threaded flange extending towards the said end of the fibre, said butt connector further comprising an alignment unit, common to both fibres, comprising,

iv. three alignment rods each having a diameter greater than the diameter of the fibres;

v. a sleeve of distortable elastic material enclosing the rods;

vi. and a rigid tube enclosing the sleeve, the tube being externally threaded at each end to permit engagement with said flange of said cap;

vii. means for inserting each fibre end between the alignment rods at opposite extremities of the rods for constraining the rods in said sleeve in a mutually parallel relationship and for placing the fibre-ends in alignment with each other; and

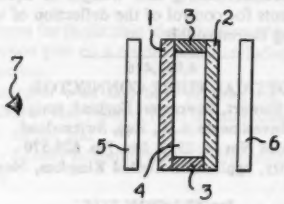
viii. means for clamping the fibre-ends comprising means for screwing the caps onto the ends of said tube, and for aligning the sleeve with the pressure faces of the carrier flanges, wherein the screwing of the caps onto the ends of the tube subjects the sleeve to pressure from the aligned pressure faces of the carrier flange and wherein the sleeve distorts under this pressure to exert on the alignment rods a clamping force which clamps the fibre ends in alignment with each other.

4,061,417

COLOR FILTER

Yoshio Katagiri, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Nov. 6, 1975, Ser. No. 629,673
Claims priority, application Japan, Nov. 14, 1974, 49-131409
Int. Cl.² G02B 5/30; G02F 1/23
U.S. Cl. 350—159 **6 Claims**



1. A color controllable filter device comprising a pair of parallel disposed transparent plates and spacer means defining a liquid crystal cell; a mixture of nematic and cholesteric liquid crystal compounds contained in said cell, said cholesteric compounds being present in an amount of from one to twenty weight percent of said mixture, said nematic liquid compounds forming the balance, said crystal mixture in said cell being free from specifically applied stress; a pair of variable-angle polarizers disposed on opposite sides of said liquid crystal cell, the wavelengths of transmissivity and reflectance of light through said device being variably controlled, based upon the polarizing angle between said variable-angle polarizer pair.

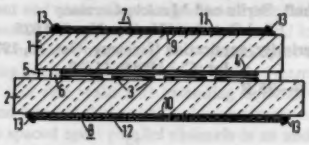
4,061,418

LIQUID-CRYSTAL DISPLAY WITH POLARIZER, AND METHOD OF MAKING THE SAME

Rudolf Poensgen, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 30, 1976, Ser. No. 728,294
Claims priority, application Germany, Oct. 7, 1975, 2544940
Int. Cl.² G02F 1/13
U.S. Cl. 350—160 LC **8 Claims**

1. In a liquid-crystal display having two carrier plates between which a liquid crystal material is enclosed in hermetically sealed relation, and having respective electrode coatings on their inner surfaces, the combination of at least one carrier plate having a polarizer disposed on the outer surface thereof, which comprises a chemically inert, transparent and optically



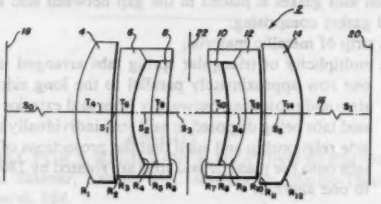
inactive protective foil and a dichroic layer disposed between the protective foil and the carrier plate, the marginal edges of the polarizer being covered with coating means for sealing the dichroic layer from atmospheric influences, particularly humidity.

4,061,419

VARIABLE MAGNIFICATION LENS SYSTEM

Edgar Elmer Price, Webster, and Louise Leone Spurles, Rochester, both of, NY, assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 3, 1976, Ser. No. 663,397
Int. Cl.² G02B 15/14
U.S. Cl. 350—184 **6 Claims**



1. A variable magnification lens including the following lens elements in alignment along an optical axis:

a front positive crown element,

a front negative flint element spaced from said crown element,

a front meniscus element spaced from said flint element,

a back meniscus element spaced from said front meniscus element,

a back negative flint element spaced from said back meniscus element,

a back positive crown element spaced from said back flint element,

said crown elements being fixed relative to each other,

said flint and meniscus elements being movable along said optical axis to vary the focal length of said lens.

4,061,420

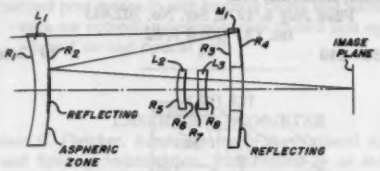
CATADIOPTRIC LENS SYSTEM

Edward K. Kaprelian, Mendham, and William E. Mimmack, Morristown, both of N.J., assignors to Questar Corporation, New Hope, Pa.

Filed May 6, 1976, Ser. No. 683,834
Int. Cl.² G02B 17/08
U.S. Cl. 350—199 **9 Claims**

1. A catadioptric objective comprising an aspheric negative meniscus corrector plate concave to the long conjugate, a primary mirror of the Mangin type spaced from said corrector plate and receiving light transmitted therethrough, a secondary mirror comprising a reflective area at the center of the second surface of said corrector plate and receiving light reflected from said primary mirror, and a spaced apart pair of

corrector lenses located between said primary and secondary mirror for receiving light from the latter, said pair of corrector

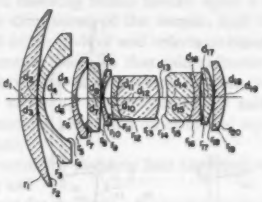


lenses comprising a positive meniscus lens convex to received light and a biconcave lens.

4,061,421
RETROFOCUS TYPE LENS SYSTEM HAVING ULTRA-WIDE ANGLE OF VIEW

Jihei Nakagawa, Higashimurayama, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed June 29, 1976, Ser. No. 700,951
Claims priority, application Japan, June 30, 1975, 50-80643
Int. Cl.² G02B *13/04*
U.S. Cl. 350—214 3 Claims



1. A retrofocus type lens system having ultra-wide angle of view comprising a first positive meniscus lens component, a second negative meniscus lens component, a third negative meniscus lens component, a fourth positive lens component, a fifth negative meniscus lens component, a sixth lens component having positive refractive power, a seventh lens component having negative refractive power, an eighth positive meniscus lens component and a ninth positive lens component, said lens system satisfying the following conditions:

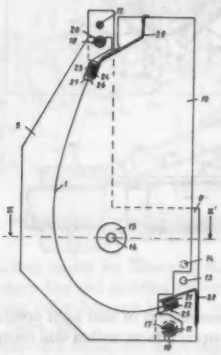
1. $1.8f < f_B < 2.3f$
2. $4.5f < f_1 < 6.5f$
3. $4.5f < f_4 < 6f$
4. $0.05f < d_{10} < 0.1f$
5. $0.6f < D_6 < 0.75f$

wherein, the reference symbol f represents the total focal length of the entire lens system as a whole, f_B is the back focal length of the entire lens system as a whole, the reference symbol f_1 designates the focal length of the first lens component, the reference symbol f_4 denotes the focal length of the fourth lens component, the reference symbol d_{10} represents the airspace between the fifth and sixth lens components, and the reference symbol D_6 designates the thickness of the sixth lens component.

4,061,422
LIGHT REFLECTING CASING

Petrus T. J. Geurts, Horst, and Albert J. Wittenberg, Velden, both of Netherlands, assignors to Océ-van der Grinten N.V., Venlo, Netherlands

Filed Feb. 25, 1976, Ser. No. 661,171
Claims priority, application Netherlands, Mar. 4, 1975, 7502508
Int. Cl.² G02B *5/10*
U.S. Cl. 350—293 14 Claims



1. A reflecting casing comprising a resilient foil having a surface for reflecting light from one side of said foil, means including a plurality of support members having aligned curved surfaces for engaging the other side of said foil and shaping said foil to the form of a developable ruled surface, and means for holding said foil curved elastically into engagement with said curved surfaces, yet keeping the curved foil movable in its own plane, said holding means engaging edge portions only of said foil.

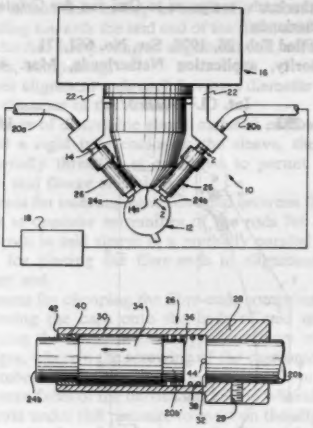
4,061,423
ILLUMINATION SYSTEM FOR OPHTHALMOSCOPE

Oleg Pomerantzeff, Brookline, Mass., assignor to Retina Foundation, Boston, Mass.

Continuation-in-part of Ser. No. 536,879, Dec. 27, 1974, Pat. No. 3,954,329, which is a continuation-in-part of Ser. No. 292,150, Sept. 25, 1972, and Ser. No. 512,327, Oct. 4, 1974, Pat. No. 3,944,341. This application Mar. 26, 1976, Ser. No. 670,701
Int. Cl.² A61B *3/14;* G02B *5/16*
U.S. Cl. 351—16 19 Claims

1. In a device for optically examining an eye and having eye illuminating means and viewing means, said eye illuminating means including a light conduit having an exit facet for contact with the eye, the improvement comprising receptacle means supportingly mounting said light conduit for movement along an optical path, biasing means for biasing said light conduit toward a first position relative to said receptacle means in which said exit facet is exterior of said receptacle, said light

conduit having a light entrance facet disposed within said receptacle means and means in said illumination means stationary relative to said movement of said light conduit for radiating light onto said entrance facet within said receptacle means.

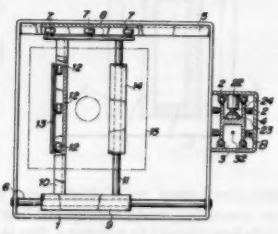


4,061,424

PHOTOGRAPHIC ENLARGER WITH MEANS FOR TRIMMING

Tetsuo Onishi, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan

Filed Apr. 8, 1976, Ser. No. 675,220
Claims priority, application Japan, Apr. 25, 1975, 50-50407
Int. Cl.[2] G03B 27/52
U.S. Cl. 355—63 5 Claims



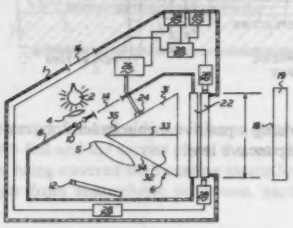
1. A photographic enlarger comprising:
a generally horizontally-disposed easel for mounting a photosensitive paper;
a vertical column stationarily disposed with respect to said easel;
a generally horizontally-disposed frame member, slidably mounted on said vertical column for vertical movement up and down said vertical column;
a first carriage assembly slidably supported by said frame member for linear movement, in a horizontal plane, relative to said frame; and
a second carriage assembly supported by said first carriage assembly and slidably mounted for linear movement in a horizontal plane, at a right angle to the path of linear movement of said first carrriage assembly, said second carriage assembly supporting a housing for a light source, means for mounting a photographic negative, a projection lens and means for focusing an image projected through said lens onto the photosensitive paper.

4,061,425

HIGH RESOLUTION ALIGNMENT INTERFEROMETER

Jackie F. Wade, Littleton, Colo., assignor to Martin Marietta Corporation, Rockville, Md.

Filed July 6, 1976, Ser. No. 702,443
Int. Cl.[2] G01B 9/02
U.S. Cl. 356—110 10 Claims



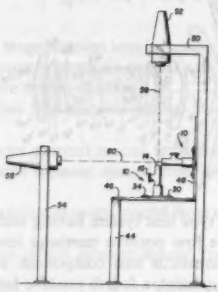
1. An autocollimator comprising a light source, a beam splitter-reflector having means for producing a zero order interference fringe fixed at an apex of said beam splitter-reflector and rotating about an axis at said apex with respect to angular misalignment of an autocollimating mirror with respect to a base of said beam splitter-reflector, and means for sensing the position of said zero order interference fringe.

4,061,426

OPTICAL ALIGNMENT DEVICE AND METHOD OF USE

Howard M. Jamison, Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 5, 1976, Ser. No. 664,334
Int. Cl.[2] G01B 11/26
U.S. Cl. 356—138 7 Claims



1. A device for optically aligning a source of radiation and a radiation receiver having a planar surface along a selected optical axis comprising:
a housing,
a first optical path in said housing,
means for positioning said housing on said receiver such that said first optical path is coincident with said optical axis, wherein said positioning means includes a substantially planar portion, at least three elements extending from said substantially planar portion and adjustably mounted to said substantially planar portion for positioning said first optical path perpendicular to said planar surface of said receiver, and means for indicating four reference points on a surface of said receiver from which the point at which said optical axis intersects said surface can be determined,
first port means in said housing along said first optical path for providing optical access for said source to said first optical path,

means in said housing for producing a second optical path in said housing intersecting at an angle with said first optical path, and

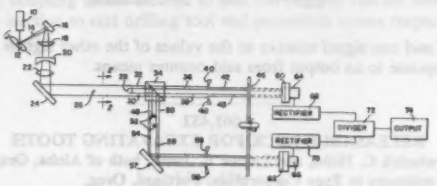
second port means in said housing along said second optical path for providing optical access to said first optical path via said second optical path.

4,061,427

LASER EXTENSOMETER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Phillip J. Stocker, South Pasadena, Calif., and Harris L. Marcus, Austin, Tex.

Filed Oct. 15, 1976, Ser. No. 732,630
Int. Cl.² G01B *11/08*
U.S. Cl. 356—159 **14 Claims**



1. A laser extensometer for measuring the cross-sectional dimension of a sample, comprising:

a source of radiant energy for directing a beam of energy incident to the sample, the cross-sectional width of said beam being larger than the cross-sectional width of the sample;

beam splitter means for dividing the radiant energy passing around the sample into a measurement and a reference beam of radiant energy, the sample located between said source of radiant energy and said beam splitter;

first pair of blocking means spaced apart a distance larger than the dimensions of the sample, said blocking means disposed in the path of said reference beam and trimming said reference beam so that said reference beam carries only information of said reference beam intensity;

means for receiving said reference and said measurement beams, and for producing an electrical signal for each of said beams;

circuitry means for dividing said electrical signals into one another; and

output means for displaying the resultant signal produced by said circuitry means, whereby said resultant signal is directly proportional to the size of the sample shadow.

4,061,428

SCANNING COLOR DENSITOMETER

Tadashi Amano, and Masaji Nakamura, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed June 18, 1976, Ser. No. 697,535
Claims priority, application Japan, June 21, 1975, 50-76113
Int. Cl.² G01J *3/50*
U.S. Cl. 356—175 **8 Claims**

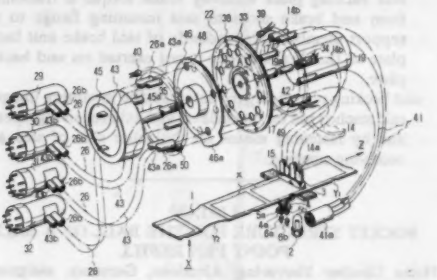
1. A scanning color densitometer for measuring the areal distribution of the photographic densities of blue-light component, green-light component and red-light component separately by optically scanning substantially the entire area of an image, comprising

plural light-conducting members having incident faces arranged across the image being moved and having light-emitting faces arranged on a first circle,

a rotary disc positioned so as to face said light-emitting faces and having at least three windows formed therein on a second circle, said second circle being coaxial to and having substantially the same diameter as that of said first circle,

plural blue, green and red filters mounted in said at least three windows, respectively,

photoelectric converters disposed in optical paths defined by said filters and said light-emitting faces so as to receive the light through said filters from said light-emitting faces,



a first detecting means for detecting the rotational position of said rotary disc and emitting a signal when said filters of a particular color become located in front of said light-emitting faces, and

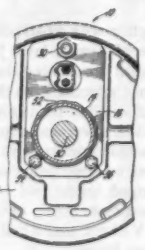
a second detecting means for detecting the rotational position of said rotary disc and releasing a command for the density measurement when any of said filters of any color become located in front of said light-emitting faces.

4,061,429

WHEEL BRAKE ASSEMBLY

Thomas P. Mathues, Miamisburg, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 26, 1976, Ser. No. 735,454
Int. Cl.² F16D *65/02*
U.S. Cl. 188—206 A **2 Claims**



1. A wheel brake assembly comprising:

a wheel brake unit including

a backing plate having an axle-receiving opening formed centrally therethrough and being formed of material having a strength characteristic incapable of taking brake torque,

brake shoes mounted on said backing plate for guided braking movement,

brake torque-taking means for taking brake torque from said shoes and including an anchor pin extending through an opening in said backing plate radially outward of said axle-receiving opening and providing backing plate circumferential locating and mounting means,

and a wheel cylinder for braking actuation of said brake shoes, said wheel cylinder having mounting means extending through an opening in said backing plate radially outward of said axle-receiving opening and

provided with brake actuating fluid connection and bleed means;

a wheel axle support member;

and a brake unit mounting flange fixed to said axle support member against movement under torque, first means securing said brake torque-taking means to said mounting flange and second means securing said wheel cylinder to said backing plate whereby brake torque is transmitted from said brake shoes to said mounting flange to said support member independently of said brake unit bacing plate so that brake torque is not exerted on said backing plate;

said backing plate being mounted on said mounting flange by said anchor pin on one side of said axle-receiving opening and by fastening means on the other side of said axle-receiving opening.

4,061,430

SOCKET STRUCTURE FOR THE BALL OF A BALL POINT PEN REFILL

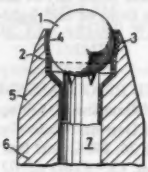
Heinz Günther Herrnring, Alveslohe, Germany, assignor to Montblanc-Simplo GmbH., Hamburg, Germany

Continuation-in-part of Ser. No. 456,806, April 1, 1974, abandoned, which is a continuation-in-part of Ser. No. 366,855, June 4, 1973, Pat. No. 3,837,750. This application Mar. 1, 1976, Ser. No. 662,940

Claims priority, application Germany, June 2, 1972, 2226902

Int. Cl.[2] B43K 7/10

U.S. Cl. 401—216 5 Claims



1. For use in connection with a ball point writing instrument refill, the combination of: a multi-layer bearing socket having an outer supporting shell comprising therein an outer dispersion layer of a substance selected from the group consisting of chromium nickel, and an alloy containing at least one of the metals chromium, nickel, silver and copper, said alloy having dispersed therein a carbide portion with a hardness exceeding 600 kg/sq. mm Vickers; an inner lining supported by said outer disperson layer arranged inside said outer shell and firmly connected thereto, said inner lining having a hardness of less than 200 kg/sq. mm Vickers, and a ball slidably engaged and embraced by said inner lining.

4,061,431

LIGHT MEASURING AND INDICATING CIRCUIT

Kenji Toyoda, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

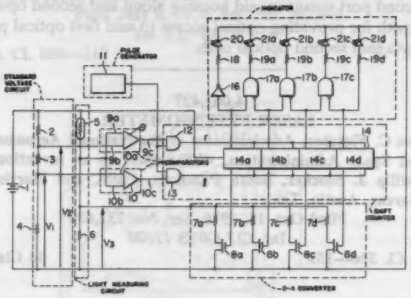
Filed Nov. 4, 1975, Ser. No. 628,654

Claims priority, application Japan, Nov. 20, 1974, 49-132790

Int. Cl.[2] G01J 1/42; G03B 7/08

U.S. Cl. 356—227 21 Claims

1. A light measuring and indicating circuit comprising means for producing three signals, the value of one of which varies relative to the values of the others in accordance with light intensity, comparator means for producing a first output when said one signal has a value less than the values of the other signals and for producing a second output when said one signal has a value greater than the values of said other signals, reversible counter means, means for operating said counter means in one direction in response to said first output, means for operating said counter means in the opposite direction in response to said second output, indicator means responsive to an output from said counter means, and means for controlling the value



of said one signal relative to the values of the other signals in response to an output from said counter means.

4,061,432

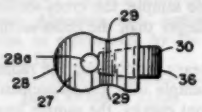
RELEASABLE LOCK FOR EXCAVATING TOOTH

Frederick C. Hahn, and Larren F. Jones, both of Aloha, Oreg., assignors to Esco Corporation, Portland, Oreg.

Filed Apr. 22, 1976, Ser. No. 679,210

Int. Cl.[2] B25G 3/36

U.S. Cl. 403—318 4 Claims



1. A releasable lock for an excavating tooth comprising:

a generally resilient plug element having a generally rigid face;

a generally rigid, relatively elongated pin element having a generally rigid face for releasable locking engagement with the face of said plug element, and

each of said element faces being equipped with a plurality of angularly related planar surfaces arranged to provide alternating crests and valleys in a direction parallel to the length of said pin element,

said plug being equipped with a unitary relatively rigid insert, said insert being partially received and retained in said plug element and partially extending therefrom, the portion of said insert extending from said plug element being equipped with said face;

said plug element being relatively elongated in a direction parallel to the length of said pin element, said plug having longitudinally extending recess means in a wall thereof to accommodate flexure upon engagement with said pin element.

4,061,433

EXTENSION ROD FOR PERCUSSIVE DRILLING TOOL

Henri Chave, Bourg en Bresse, France, assignor to Ugine Aciers, Paris, France

Filed July 20, 1976, Ser. No. 707,020

Claims priority, application France, Aug. 13, 1975, 75.25708

Int. Cl.[2] F16B 7/04

U.S. Cl. 403—359 9 Claims

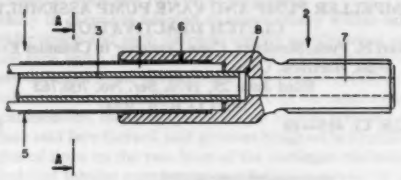
1. A composite extension rod for interconnecting a drilling tool and a percussion means, said extension rod comprising:

a. a central tube, said tube being hollow throughout to allow flow of cooling fluid,

b. a plurality of elongated parallel high strength rods of a

cross-section smaller than said tube arranged about the periphery of said tube, each rod being in contact with the next adjacent parallel rod,

c. an outer sheath covering said parallel rods and holding said rods against said tube, and



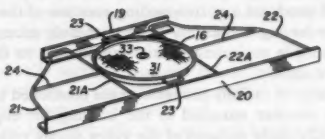
d. coupling means secured to said rod on each end for connection to said drilling tool and percussion means respectively.

4,061,434

REINFORCED CONCRETE CATCH BASIN COVER AND LID

Glenn T. Carroll, 1850 Price Road, Youngstown, Ohio 44509

Filed Mar. 21, 1977, Ser. No. 779,608
Int. Cl.² F16D *1/00*; F16L *25/00*
U.S. Cl. 404—4 4 Claims



1. A reinforced concrete catch basin cover and lid comprising a reinforcing member having spaced parallel front and back angle iron sections, interconnecting members secured thereto and a ring member disposed centrally thereof, said front and back sections and the outermost ones of said interconnecting members defining a shape substantially the same as that of the concrete catch basin cover and a cast concrete body enveloping said reinforcing sections and members, said ring defining an opening in said cover.

4,061,435

ROADWAY DELINEATOR

Donald W. Schmanski, and Thomas J. Rose, both of P.O. Box 1298, Carson City, Nev. 89701

Filed Aug. 19, 1976, Ser. No. 716,021
Int. Cl.² E01F *9/00*
U.S. Cl. 404—10 8 Claims

2. A roadway delineator comprising

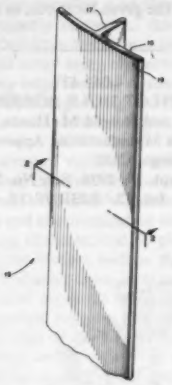
an elongate post made of elastic materials and having at least one longitudinal shear plane extending substantially the length of the post, and individual components separated by each said longitudinal shear plane;

a pointed tip telescoped onto one end of the post;

at least one collar closely fitting around and slidable on the post;

a cap having a flat, impact receiving upper surface and a lower recess closely fitting over the other end of the post;

a highway marker sign affixed to the collar; and



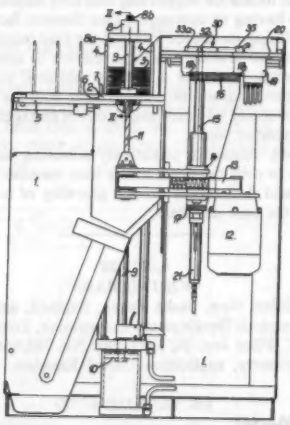
means fixing the collar to only one of the individual components of the post.

4,061,436

BANKNOTE INVALIDATING MACHINE

Franz Durrer, Kussnacht, Switzerland, assignor to Compagnie Industrielle Radioelectrique, Switzerland

Filed Oct. 1, 1976, Ser. No. 728,605
Claims priority, application Switzerland, Oct. 3, 1975, 12843/75
Int. Cl.² B23B *39/00*; B26D *7/06*
U.S. Cl. 408—3 4 Claims



1. A banknote invalidating machine, comprising; a frame; a horizontal plate slidably mounted on the frame for receiving and supporting and for slidably positioning thereby on the frame a pile of banknotes, each parallel to the plate; means on the plate defining a space to be occupied thereon by the pile of banknotes; a press on the frame for compressing the pile of banknotes occupying said space, the slidable mounting of the plate being effective to slide the plate from a loading position thereof for receiving the pile of banknotes to a working position for the compressing of the pile and back to the loading position; a perforating tool movable relative to the plate and thereby relative to the pile of banknotes thereon; a support unit horizontally and vertically movable on the frame for mounting the perforating tool to register the tool, in the horizontal mov-

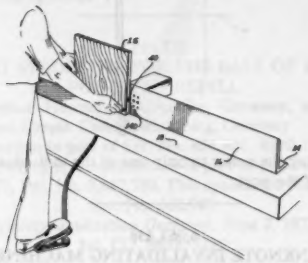
ing of the unit, with given locations of the compressed pile of notes in the working position; and means for repeatedly upwardly moving and downwardly returning the support unit and for actuating the perforating tool to perforate the pile of notes by the tool, at the given locations, in the vertical upward moving of the unit.

4,061,437

PILOT HOLE BORER

Delbert D. Strange, and Ronald M. Hunts, both of San Diego, Calif., assignors to Manufacturing Approaches & Total Concepts, Inc., San Diego, Calif.

Filed Sept. 16, 1976, Ser. No. 723,973
Int. Cl.² B23B 39/16
U.S. Cl. 408—42 **12 Claims**



2. Apparatus for drilling guide holes in a base member, which guide holes receive securing means for attaching a precisely located fitting on the base member, said apparatus comprising in combination:

a. drill means for drilling a plurality of holes in spaced relation in the base member;

b. bracket means for supporting said drill means, said bracket means having an upstanding face thereon face and including indexing means for locating the base member along the face of said bracket means in relation to said drill means;

c. displacing means for extending said drill means through said bracket means into engagement with the base member and retracting said drill means out of engagement with the base member; and

d. controls means for selectively actuating said displacing means to drill the holes in the base member;

whereby, said drill means drills a plurality of holes precisely located in the base member.

4,061,438

BORING BARS

Ronald William New, Stoke Poges, England, assignor to National Research Development Corporation, London, England

Filed Jan. 26, 1977, Ser. No. 762,666
Claims priority, application United Kingdom, Feb. 5, 1976, 4600/76
Int. Cl.² B23B 47/00
U.S. Cl. 408—143 **15 Claims**

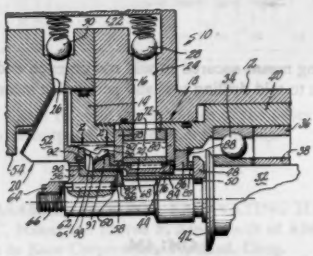
1. A boring bar comprising a tubular shank having a rearward end, by which it is mounted, and a forward end having means for mounting a cutting tool, a bung tight-fitted into at least a rear portion of the shank, said bung having a modulus of elasticity substantially greater than that of the shank, the shank having adjacent the tool mounting means a closed cavity in which is positioned a damper mass with a damping clearance between the mass and the inner wall of the cavity, said damping clearance containing a damping fluid.

4,061,439

IMPELLER PUMP AND VANE PUMP ASSEMBLY WITH CLUTCH DEACTIVATION

Karl H. Pech, Simsbury, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.

Filed June 29, 1976, Ser. No. 700,763
Int. Cl.² B27C 9/00
U.S. Cl. 415—18 **5 Claims**



1. A fuel pump assembly for a gas turbine engine comprising:

a pump housing;

a primary drive shaft mounted for rotation within the housing;

an impeller mounted upon the drive shaft in driving connection therewith such that rotation of the primary drive shaft produces a corresponding rotation of the impeller;

a rotor having a plurality of slots therein mounted in the housing in encircling coaxial relationship to the primary drive shaft;

a plurality of radially movable vanes positioned in the slots;

a cam member mounted in the housing for engaging the radially outer surfaces of the vanes during rotation of the rotor for producing radially inward and outward vane movements;

a secondary drive shaft at least partially disposed between the primary drive shaft and the rotor in driving connection with the rotor such that rotation of the secondary drive shaft produces a corresponding rotation of the rotor;

means to engage the secondary drive shaft to drivingly interconnect the impeller and the secondary drive shaft;

spring means to bias the engaging means into contact with the secondary drive shaft; and

means urged radially outwardly by centrifugal force to progressively counter the bias of the spring means as the primary shaft speed increases and allow disengagement of the engaging means from the secondary drive shaft at a predetermined speed of the primary drive shaft.

4,061,440

DEVICE FOR CONTROLLING THE VARIATION IN PITCH OF THE BLADES OF A FAN

Pierre A. Belliere, Antibes, France, assignor to Ratier-Forest, Paris, France

Filed Apr. 21, 1976, Ser. No. 679,034
Claims priority, application France, Apr. 30, 1975, 75.13500
Int. Cl.² B64C 11/38
U.S. Cl. 416—157 R **8 Claims**

1. A device for controlling the variation in pitch of the blades of a fan carried by a rotary shaft, said device comprising:

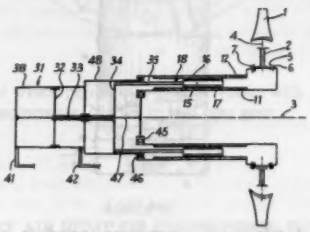
a bevel-pinion secured to each said blade;

two bevel ring-gears coaxially arranged with respect to said

shaft and permanently in mesh with all said bevel pinions on opposite sides thereof;

two cylindrical tubular members arranged one inside the other coaxially about said shaft, the tubular members being spaced apart axially to form an annular space therebetween, the tubular members being coupled respectively for rotation with said two bevel ring-gears;

a plurality of carriages adapted to move axially within said annular space and each carriage having a cylindrical external face and a cylindrical internal face located respectively opposite to the internal face of the outer cylindrical tubular member and to the external face of the inner cylindrical member, the carriages having a helical groove cut in each said face thereof, said grooves being set at opposite angles of slope on the two faces of the carriages, the outer cylindrical tubular member having helical grooves cut in the internal face thereof, the helical grooves in said outer



cylindrical tubular member mating with said helical grooves in said cylindrical external faces of said carriages, the inner cylindrical tubular member having helical grooves cut in the external face thereof, the helical grooves in said inner cylindrical tubular member mating with said helical grooves in said cylindrical internal faces of said carriages;

arrays of balls partially engaged in said helical grooves of said carriages and in said mating helical grooves of said cylindrical tubular members; and,

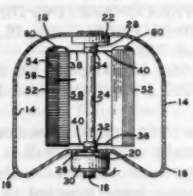
at least one axial hydraulic jack, said jack having a stationary part rigidly fixed to said shaft and a movable part rigidly fixed to said carriages, one of said two parts being a cylinder and the other part being a piston mounted for reciprocating motion in said cylinder without rotary motion relative thereto, all of the helical grooves being positioned externally with respect to said cylinder.

4,061,441

CENTRIFUGAL FAN FOR CIRCULATING ROOM AIR

Reynaldo Mejia, 122 S. Sixth St., Fowler, Calif. 93625

Filed Apr. 21, 1976, Ser. No. 678,883
Int. Cl.[2] F04D *29/28*
U.S. Cl. 416—175 **1 Claim**



1. A fan for circulating room air comprising:

an impeller supported for unidirectional rotation about a vertically oriented axis including:

A. a vertically oriented impeller shaft supported for driven rotation;

B. a pair of spaced, horizontally oriented end plates mounted in vertical registration on said shaft for unidirectional rotation, each end plate of said pair comprising:

a center section having defined therein a uniform array of radially extended slots for accommodating passage of air vertically through the plate, a uniform array of arms, each arm being integrally related to the center section and radially extended from between a pair of adjacent slots, each arm of said array being characterized by a distal end having a trailing edge surface, relative to the direction of plate rotation, including contiguous linear segments defining therebetween an included angle greater than 90° but less than 180°;

C. a cylindrical array of vertically oriented impeller blades extended between the distal end portions of said arms and defining a pressure chamber concentrically related to the array of blades and communicating with the array of slots, each blade being characterized by planar panel segments defining along the leading surface thereof a compression chamber of a V-shaped cross-sectional configuration, the planes of the panel segments being coincident with vertical planes extended between the registered contiguous surfaces of the arms of the pair of end plates, each compression chamber being closed at the lowermost end thereof by a planar surface of the distal end of one arm of the lower plate;

D. a deflector of a compound curved configuration projected upwardly from the distal end of each arm of the upper plate defining an air scoop communicating with a juxtaposed compression chamber defined along the leading surface of one of said blades for forcing air downwardly into the compression chamber;

E. means including a plurality of angularly spaced bars defining a base for supporting said impeller in a vertical orientation; and

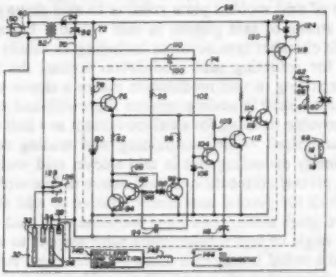
F. means including an electrically energizable motor connected with said shaft for imparting unidirectional rotary motion to said impeller.

4,061,442

SYSTEM AND METHOD FOR MAINTAINING A LIQUID LEVEL

Anthony W. Clark, Carrollton, and Rex G. Stubbs, Jr., Garland, both of Tex., assignors to Beckett Corporation, Dallas, Tex.

Filed Oct. 6, 1975, Ser. No. 619,901
Int. Cl.[2] F04B *49/00*; F25D *17/02*; G08B *21/00*
U.S. Cl. 417—36 **9 Claims**



1. A liquid level control system for an air conditioner comprising:

first and second conductive probes suspended above a body of liquid and extending below a maximum desired level,

a third conductive probe suspended above the body of liquid and extending downwardly to said maximum desired level,

an oscillator normally coupled to said first and third probes for generating a high frequency signal,

electronic switching means coupled to said probes and said oscillator, said switching means being switched to a first

state in response to said high frequency signal when the liquid level does not contact said third probe and being switched to a second state when the liquid level contacts said third probe,

means responsive to said second state of said switching means for coupling said second probe to said oscillator, wherein said switching means is maintained in said second state as long as the liquid level contacts said second probe,

pump means responsive to said second state of said switching means for lowering the liquid level of the body of liquid, and

a fourth safety overflow prevention conductive probe connected to terminate operation of said air conditioner if the liquid level rises to a predetermined oveflow level.

4,061,443

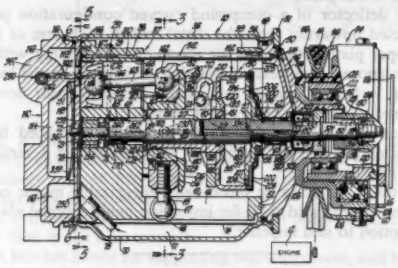
VARIABLE STROKE COMPRESSOR

Dennis A. Black, Dayton, and Byron L. Brucken, Miamisburg, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1976, Ser. No. 747,043

Int. Cl.[2] F04B *1/26, 1/12;* F01B *13/04;* F16H *23/00*

U.S. Cl. 417—222 **5 Claims**



1. In a variable output compressor having a housing, a cylinder block disposed in said housing, a circular drive shaft having its one end journaled in one wall of said housing and its other end journaled in said cylinder block, said cylinder block having a plurality of cylinder bores formed therein substantially parallel to the axis of said drive shaft, pistons arranged to reciprocate in said cylinder bores, a wobble plate operated in response to rotation of said shaft and drivingly connected to said pistons, compressor output modulation means for varying the angle of said wobble plate relative to said drive shaft and thus the stroke of said pistons in said cylinder bores, and an expansible chamber type actuator including an axially movable member for actuating said modulation means, the improvement comprising in said modulation means a sleeve surrounding said drive shaft in sealing relation therewith and connected to said movable member for axial movement as a unit along the axis of said shaft while maintaining said sealing relation, a longitudinally extending slot in said sleeve, said wobble plate having a pivotal connection to said sleeve in line with the axis of said shaft for pivotal movement relative to said sleeve and said drive shaft during said axial movement of said sleeve to vary the angle of said wobble plate with respect to said drive shaft, and a radial lug on said drive shaft having a rotary driving connection to said wobble plate, said driving connection including means forming a cam track on said lug along the axis of said drive shaft, and a follower in said cam track interconnecting said wobble plate and said drive shaft and movable axially with respect to said lug in response to movement of said sleeve whereby said angle of said wobble plate is varied with respect to said drive shaft to infinitely vary the stroke of said pistons in said cylinder bores and thus the output of said compressor, said lug having a predetermined dimension relative to said slot such that when said lug is received in said slot a longitudinal clearance space is provided between said lug and the sides of said slot throughout the axial movement of said sleeve, said clearance space facilitating a direct rotary driving relation between said lug and said wobble plate while preventing a direct rotary driving relation between said shaft and said wobble plate at the pivotal connection of said wobble plate to said sleeve thereby to obviate torque load transfer between said shaft and said wobble plate at said pivotal connection.

4,061,444

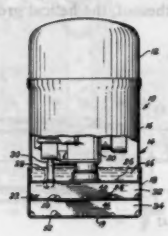
COMPRESSOR MUFFLING ARRANGEMENT

William R. Dirk, and Sidney A. Parker, both of Fort Worth, Tex., assignors to Lennox Industries, Inc., Marshalltown, Iowa

Filed July 30, 1976, Ser. No. 710,012

Int. Cl.[2] F04B *21/00;* F25B *41/00;* F01N *7/18*

U.S. Cl. 417—312 **7 Claims**



1. In a refrigerant compressor including outer housing means, compression mechanism within the outer housing means, and an oil sump within the outer housing means, the improvement comprising discharge gas muffling means formed within the outer housing means, such discharge gas muffling means comprising a part of the outer housing means, first wall means, and second wall means cooperating therewith to provide first and second chambers in the discharge gas muffling means, an inlet port in the second wall means for communicating the compression mechanism with the first chamber for receiving discharge gas from the compression mechanism, said first chamber communicating with said second chamber, and a discharge port from said second chamber adapted to communicate to a discharge line, and divider wall means in said first chamber and said second chamber having restricted openings therein for providing a plurality of muffling regions in said first and second chambers, a restricted opening in said first wall means communicating one muffling region in the second chamber with a muffling region in the first chamber, the oil sump defined within the compressor by the outer housing means and the second wall means, whereby discharge gas will pass from the inlet port through a plurality of restricted openings and expansion chamber muffling regions and will be discharged from the discharge port.

4,061,445

POWER-CONVERTING DEVICE

Niranjan Kumar Doshi, East St. Louis, Ill., assignor to Frank Apostol, St. Louis, Mo.

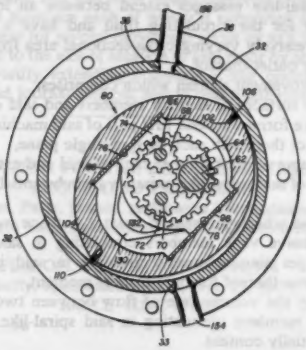
Filed May 10, 1976, Ser. No. 684,537

Int. Cl.[2] F01C *1/02, 19/04, 19/08;* F04C *17/02*

U.S. Cl. 418—54 **11 Claims**

1. A power-converting device that comprises a chamber which has a generally-cylindrical wall, a generally-elliptical rotor which is disposed within said chamber and which has a major axis, said rotor being mounted to rotate within said chamber and to reciprocate along said major axis as it rotates within said chamber, a plurality of seals that permit rotation and reciprocation of said rotor relative to said chamber while providing a sealing action between said rotor and said chamber, an inlet port for said chamber which admits fluid, an outlet port for said chamber which exhausts fluid, said rotor reciprocating as it rotates within said chamber, a shaft which has a

gear thereon, a ring gear that meshes with and rotates with said gear on said shaft, and interacting surfaces on said rotor and on



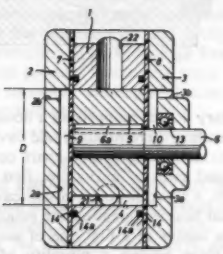
said ring gear which permit said rotor to rotate with said ring gear but to reciprocate relative to said ring gear.

4,061,446

ROTARY AIR PUMP OR COMPRESSOR WITH FLEXIBLE END SEALING PLATES

Hiroshi Sakamaki, Utsunomiya; Toshiyuki Maeda, Ageo; Toshimitsu Sakai, Okazaki, and Tadashi Saitou, Toyota, all of Japan, assignors to Nippon Piston Ring Kabushiki Kaisha, Tokyo and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

Filed Apr. 22, 1976, Ser. No. 679,444
Claims priority, application Japan, May 1, 1975, 50-59238[U]
Int. Cl.[2] F01C *19/08, 5/06;* F04C *27/00*
U.S. Cl. 418—133 4 Claims



1. In a rotary air pump or compressor including a stator housing, end wall structure mounted on the opposite ends of said stator housing to form a cylindrical pump cavity and a rotor mounted within the pump cavity and co-operating with the inner peripheral wall of said stator housing to form suction, compression and delivery chambers; a flexible sealing plate comprising a flat peripheral flange portion clamped between the end faces of said stator housing and said end wall structure, and a substantially cone shaped portion protruding inwardly from said flat flange portion to be pressed upon assembly onto the end face of said rotor and substantially coinciding at its apex with the axis of said rotor, the height of said cone shaped portion from the inner surface of said flat flange portion being determined in a range of

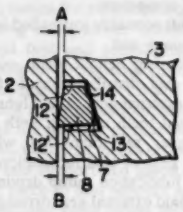
$$\frac{\text{Inner diameter of the pump cavity}}{5 \times 10^{1} \text{ to } 5 \times 10^{3}}$$

4,061,447

OIL SEAL FOR ROTARY ENGINE

Shinji Kato, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 5, 1975, Ser. No. 547,339
Int. Cl.[2] F01C *19/12*
U.S. Cl. 418—142 11 Claims



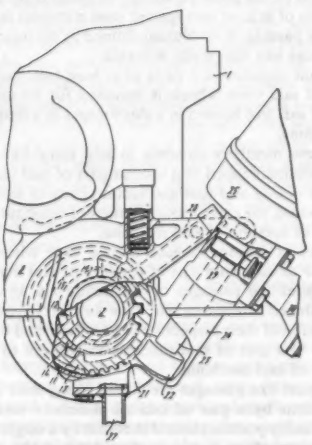
1. An oil seal device for a rotary engine characterized in that a rotor is provided capable of making eccentric rotation about an eccentric shaft within a rotor housing and side housing disposed covering both sides of said rotor housing, and annular recesses are provided in both side faces of said rotor so as to surround a hole through which the eccentric shaft extends, each of said recesses having a slant or bevel at its innermost end, and a radially elastic, annular seal ring supported by and having a surface in direct contact with each said slant or bevel for securing sealing between the respective sides of said rotor and the opposed faces of said side housing, at least one of said surface and said slant or bevel being arcuate, whereby after initial radial contraction or expansion each said seal ring is pressed axially against said side housing by radial movement of each said seal ring relative to its respective said slant or bevel caused by a restorative force from the initial contraction or expansion acting against the slant or bevel.

4,061,448

DRIVE FOR THE IGNITION DISTRIBUTOR OF AN INTERNAL COMBUSTION ENGINE

Hans-Ullrich Gondeck, Cologne, Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 8, 1976, Ser. No. 739,893
Claims priority, application Germany, Nov. 11, 1975, 2550501
Int. Cl.[2] F01C *1/10;* F03C *3/00*
U.S. Cl. 418—170 4 Claims



1. An improved drive for the ignition distributor of an inter-

nal combustion engine of the type having a crankshaft and a lubrication pump driven by said crankshaft, said lubrication pump including a housing, an external gear having internal teeth and an internal gear having external teeth meshing, in planetary gear fashion, with the internal teeth of said external gear, said internal and external gears being located in said housing, said internal gear driving said external gear and being coaxial with, and rotatably driven by, said crankshaft, wherein the improvement comprises:

a distributor shaft rotatably journalled in said housing of said lubrication pump; and

a pinion gear having helical teeth, said pinion gear being attached to said distributor shaft for causing rotation thereof, said external gear of said lubrication pump having external helical teeth meshing with said helical teeth of said pinion gear, said crankshaft when rotating driving said internal gear of said lubrication pump, said internal gear of said lubrication pump driving said external gear thereof, and said external gear driving said pinion gear and said distributor shaft.

4,061,449

FLUID ROTATING MACHINES WITH SPIRAL-LIKE PASSAGES AND VANE WHEELS

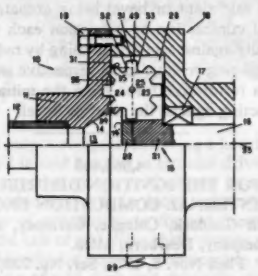
Eugeniusz M. Rylewski, 43 bis, Avenue du Gal Leclerc, 78470 St. Remy les Chevreuse, France

Filed Dec. 10, 1975, Ser. No. 639,629

Claims priority, application France, Dec. 12, 1974, 74.40998

Int. Cl.[2] F01C 1/00; F03C 3/00; F04C 1/00

U.S. Cl. 418—226 **2 Claims**



1. In a positive-displacement rotative machine in which the conversion of the pressure energy of fluids is obtained by the circulation of at least two spaced vane members in at least one spiral-like passage of revolution defined by rib members having top surfaces and side walls, wherein

said vane members are parts of at least two vane wheels,

each of said vane wheels is mounted for rotation about its own axis and housed in a slot formed in a first part of said machine,

said vane members circulate in said spiral-like passages of revolution formed in a second part of said machine,

at least one of said first and second parts of said machine is rotatable, the axis of rotation thereof constituting the main axis of rotation of said machine,

the axes of rotation of each of said vane wheels are transverse to said main axis of rotation of said machine,

said spiral-like passages of revolution are generated by a combined rotation of said vane members about the axis of rotation of their respective vane wheels and by rotation of said first part of said machine in relation to said second part of said machine,

said spiral-like passages are bound along their intermediate portions by a pair of said rib members while each end extremity portion thereof is bound by a single rib member,

said intermediate portions of said spiral-like passages are closed across the top surfaces of said rib members by a cooperating surface formed on said first part of said machine receiving said vane wheels in sliding contact therewith to thereby form channels for the circulating fluid, and

said spiral-like passages extend between an inlet and an outlet for the circulating fluid and have a continuous progressively varying cross-sectional area from the inlet to the outlet thereof,

the improvement therein which comprises:

said top surfaces of said rib members and said cooperating surface formed on said first part of said machine in sliding contact therewith each lie in a single plane,

the volume rates of flow at each of said end extremity portions of said spiral-like passages are substantially the same, and

said vane wheels are spaced apart a distance such that two successive vane members circulating in said spiral-like passages simultaneously circulate in said intermediate portions thereof for only a short moment,

whereby the volume rate of flow between two successive vane members circulating in said spiral-like passages is essentially contant.

4,061,450

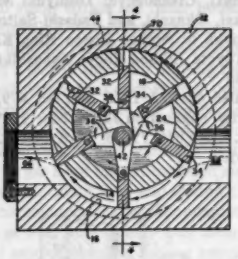
POSITIVE DISPLACEMENT VANE TYPE ROTARY PUMP

Charles A. Christy, P.O. Box 485, Tijeres, N. Mex. 87059

Continuation-in-part of Ser. No. 564,288, April 2, 1975, Pat. No. 4,011,033. This application Oct. 27, 1976, Ser. No. 736,150

Int. Cl.[2] F01C 1/00

U.S. Cl. 418—253 **6 Claims**



1. A vane rotary device comprising a housing member having a cavity extending therethrough, said cavity including two cylindrical portions having spaced-apart centers but having substantially equal radii of curvature, first and second end closure members, a rotor disposed in said cavity and rotatably supported in said housing member for rotation about an axis coaxial with the center of a first one of said two cylindrical portions, said rotor having a plurality of radial openings therein, vane means disposed in each of said radial openings for sliding movement therein and rotary movement along with said rotor, an inlet passage and an outlet passage in said housing member communicating with said cavity, said inlet passage being separated from said outlet passage by said first and second cylindrical portions, a second cylindrical portion of said cavity forming a circumferential channel extending from said inlet passage to said outlet passage, said channel in operation of said pump serving as a fluid pumping chamber, said vane means extending radially outwardly of said rotor and in substantial pressure sealing relationship with said channel but maintaining a slight clearance therebetween while being rotated through said channel by said rotor thereby pumping fluid from said inlet passage to said outlet passage, said first cylindrical portion of said cavity constituting a non-pumping circumferential portion between said outlet passage and said inlet passage over which said rotor passes with said vane means retracted within said rotor and a circumferential groove confined within said first cylindrical portion and having opposite ends terminating short of reaching said inlet and outlet pas-

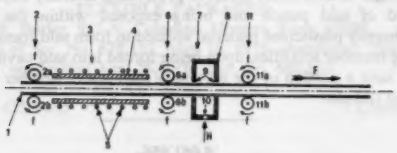
sages to provide communication only between radial openings simultaneously passing said first cylindrical portion to relieve pressure therein and thereby to facilitate radial movement of said vane means, and said vane means comprise a plurality of sliding blade members each of which is supported on a fixed journal element for pivotal movement about an axis parallel to but eccentric to the axis of rotation of said rotor by at least one radially inwardly extending connecting link pivotally connected to said journal element and to said blade member.

4,061,451

INSTALLATION FOR THE ZONAL TREATMENT OF ELONGATED PRODUCTS

Gérard Bardet, Paris, France, assignor to Automatisme & Technique, Sevres and Desmarquest & C. E.C., Arcueil, both of France

Filed Oct. 15, 1975, Ser. No. 622,744
Claims priority, application France, Oct. 21, 1974, 74.35332
Int. Cl.² B29C *17/02*
U.S. Cl. 425—66 **7 Claims**



1. Apparatus for heating a predetermined zone of an elongated product, comprising:

means for introducing the elongated product to a predetermined zone of treatment;

means for extracting the treated product from said predetermined zone of treatment;

means at said predetermined zone defining a cavity resonator through which said elongated product passes along a longitudinal axis, said cavity resonator when supplied with ultrahigh frequency electromagnetic energy being operative to maintain stationary waves of a resonant mode at a fixed predetermined location occupied by said elongated product moving through said cavity resonator to obtain a concentration of said ultrahigh frequency energy in the elongated product within said zone; and

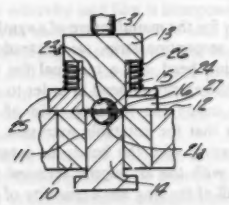
means operative to supply ultrahigh frequency electromagnetic energy to said cavity resonator.

4,061,452

APPARATUS FOR PRODUCING SPHERICAL ARTICLES

Raymond P. DeSantis, Royal Oak, Mich., assignor to Wolverine Aluminum Corporation, Lincoln Park, Mich.

Continuation of Ser. No. 619,898, Oct. 6, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 761,003
Int. Cl.² B30B *11/02*
U.S. Cl. 425—78 **4 Claims**



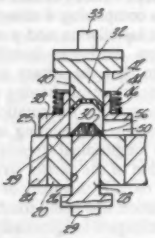
1. An apparatus for compacting powder material into a spherical article, said apparatus comprising a punch and die assembly comprising a stationary die plate, a bore in said die plate, a punch disposed reciprocably in said bore, a compacting face on the end of said punch forming a first half-mold cavity and an annular surface surrounding said first half-mold cavity, a counterpunch having a flat annular end surface engageable with said die plate and overlapping the bore in said die plate without penetrating into said bore, a second half-mold cavity disposed within said counterpunch end annular surface, said second half-mold cavity being of a diameter equal to and being alignable with said first half-mold cavity alignable with said first half-mold cavity, means for reciprocating said punch to a position for compacting said powder material in a molding cavity formed by said first and second half-mold cavities, support and guide means for said counterpunch provided with an end face in constant engagement with said die plate, means for applying a clamping force to said counterpunch with the overlapping portion of the flat end surface thereof in engagement with said die plate, abutment means on said counterpunch for engagement with said support and guide means for transmitting said clamping force to said support and guide means, and a slot in said support and guide means providing clearance for said article partially projecting from said die plate during lateral motion of said support and guide means subsequent to release of said clamping force.

4,061,453

TOOLING FOR A POWDER COMPACTING PRESS

Raymond P. DeSantis, Royal Oak, Mich., assignor to Wolverine Aluminum Corporation, Lincoln Park, Mich.

Continuation of Ser. No. 619,856, Oct. 6, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 761,333
Int. Cl.² B30B *11/02*
U.S. Cl. 425—78 **5 Claims**

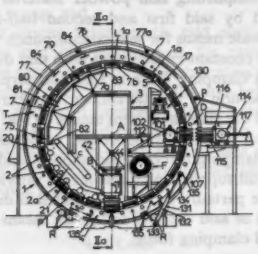


1. An apparatus for compacting powder material into a compacted article, said apparatus comprising a stationary die plate, a die in said die plate having a vertically disposed bore and an upper surface, a first punch reciprocably movable in said bore and having an upper end face, a second punch laterally displaceable to a position in axial alignment with said die bore, said second punch being reciprocably movable for overlappingly closing said bore upper end and having a lower end face provided with a cavity overlapping said bore, said cavity being closed by the end face of said first punch when in flush relation with said die upper surface and defining therewith a mold for compacting said powder material by displacement of said first punch toward said second punch, wherein at least part of said mold formed by said cavity is made of elastomeric material, support and guide means for said second punch provided with an end surface for engagement with said die plate, means for applying a clamping force to said second punch in engagement with said die plate upper surface with said cavity overlapping said bore, abutment means on said second punch for engagement with said support and guide means for transmitting said clamping force to said support and guide means, means for retracting said second punch away from said die upper surface, and a slot in said support and guide means for clearing said compacted article projecting above said die upper surface during lateral displacement of said second punch and said support and guide means after retraction of said second punch.

4,061,454
FACTORY-TYPE APPARATUS FOR PRODUCING PRESTRESSED CONCRETE PRODUCTS

Mircea Borcoman, 20, rue de Boulainvilliers, 75016 Paris, France

Filed Mar. 22, 1976, Ser. No. 668,930
Claims priority, application France, Mar. 27, 1975, 75.09580
Int. Cl.² B28B *1/10, 5/04, 23/04*
U.S. Cl. 425—88 31 Claims



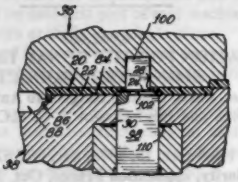
1. A monoblock factory or installation for the manufacture of concrete products, in particular prestressed and/or reinforced concrete products, comprising a rotary supporting housing of a general cylindrical shape having a horizontal axis of rotation, a plurality of working stations mounted on a construction disposed in the interior of said housing, and a plurality of conveying moulds, for the concrete products, disposed on the internal surface of said housing so as to cause these moulds to pass in front of various of said working stations, the said working stations comprising a concrete-casting installation, a heat-treatment installation and a mould-stripping and manufactured products discharge installation, said factory being characterized in that the rotary housing comprises a rotatable circular carrier structure having a horizontal axis and supported by means permitting the rotation of the said carrier structure on its axis, means for rotating said carrier structure and means resistant to longitudinal stresses in a direction parallel to the axis of rotation of the carrier structure, said resistant means being disposed radially inwardly of the carrier structure toward the axis of rotation and being fixed to the carrier structure, and comprising elongate longitudinal extending members defining longitudinal recesses extending parallel to the axis of rotation of the carrier structure and provided around the entire internal periphery of the said carrier structure, the said recesses receiving sets of moulds for the products to be manufactured, the said resistant means comprising at one longitudinal end, means for the attachment of reinforcement wires of the concrete products and, at its other longitudinal end, means for tensioning the reinforcement wires, such that the tensile stresses of these wires are taken up exclusively by the aforesaid resistant means.

4,061,455
APPARATUS FOR MOLDING AN INSERT MEMBER IN A FRAME MEMBER

John W. von Holdt, 7430 N. Croname Road, Niles, Ill. 60648

Filed May 6, 1976, Ser. No. 683,906
Int. Cl.² B29F *1/10*
U.S. Cl. 425—112 11 Claims

1. A mold for forming a member defining a frame, said frame surrounding and retaining an insert member, said mold comprising a pair of relatively movable cavity plate assemblies arranged, when positioned together, to define at least one cavity having the configuration of said frame-defining member, one of said cavity plate assemblies defining a channel spaced from said cavity for receiving and supporting a strip of insert-forming material, a plunger, carried by the other of said cavity plate assemblies, and movably positioned on an axis transverse to said channel, and in communication therewith, a punch movable through said one cavity plate assembly in alignment with said plunger, said punch being movable from a position on one side of said channel to a position intersecting said channel and thereafter to a position in abutting relation with said plunger in said cavity whereby an insert member may be sheared by said punch from said elongated strip of insert-forming material in said channel, and moved into engagement with said plunger in said cavity, said punch and plunger being

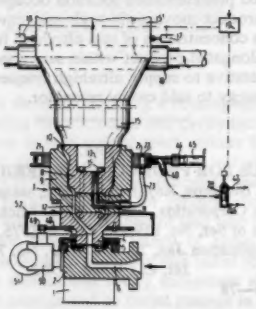


proportioned to retain and support said insert member with the margin of said insert member protruding laterally beyond the end of said punch and being exposed within the cavity, whereby plasticized material utilized to form said frame-defining member solidifies, upon being forced into said cavity, with at least a portion of the margin of said insert member embedded therein.

4,061,456
EXTRUDER FOR THE MANUFACTURE OF A SYNTHETIC RESIN FOIL IN THE SHAPE OF A SERPENTINE STRIP

Franciscus Elbertus Mulder, Putten, Netherlands, assignor to Proost en Brandt N.V., Amsterdam, Netherlands

Filed Oct. 30, 1975, Ser. No. 627,267
Claims priority, application Netherlands, Nov. 1, 1974, 7414315
Int. Cl.² B29F *3/08*
U.S. Cl. 425—140 12 Claims



1. An extruder for the manufacture of a synthetic resin foil in the shape of a serpentine strip, said extruder comprising a rotatable extrusion head and a terminal for the controllable supply of air to the extrusion head in order to maintain a given excess pressure inside the forming strip of synthetic resin, characterized in that the rotatable extrusion head includes a hollow ring rotating with the head, the interior of said ring communicating with the air supply terminal for the head, in that an outer wall of the ring has a plurality of passages equally spaced apart in the circumferential direction and closed by non-return valves urged in the outward direction by spring force against the associated seats, said valves having a portion projecting out of the outer surface of said wall in the closed state, in that the outer surface of said wall being constructed in the form of a sliding face, with which sliding face cooperates a

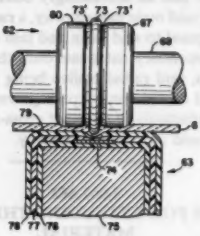
stationary shoe having a depression, which shoe is spring pressed against said sliding face and the edges of which shoe co-operate in sealing fashion with the sliding face, said depression being provided with an air supply terminal, and in that the shoe engages the projecting portions of those valves lying beneath the shoe in order to urge such valves into the open position, the depression covering in the circumferential direction a distance at least corresponding with the distance between two passages plus twice the diameter of said passages.

4,061,457

APPARATUS FOR PRODUCING RUPTURE LINES IN FLEXIBLE PACKAGES

Robert W. Butler, 912 N. Colorado, Ulysses, Kans. 67880

Division of Ser. No. 578,132, May 16, 1975, abandoned. This application Apr. 26, 1976, Ser. No. 680,520
Int. Cl.² B29C *15/00*
U.S. Cl. 425—385 **7 Claims**



1. Apparatus for forming weakened areas in plastic film, said apparatus comprising:

a. a frame structure;

b. first mold means mounted on said frame structure and having a male portion with a first mold surface and a protuberance extending therefrom, said first mold surface and protuberance being engageable with one surface of a plastic film;

c. second mold means mounted on said frame structure and having a second mold surface adjacent and in facing relation with said first mold surface and protuberance, said second mold surface having a portion receiving said protuberance and being engageable with a second surface of the plastic film simultaneously with and adjacent said first mold surface whereby said film is interposed between said first and second mold surface while said protuberance is urged into deforming relation with said film and said film is urged into said second mold surface portion;

d. heating means in heat transfer relation with at least one of said first mold means and said second mold means for supplying heat thereto; and

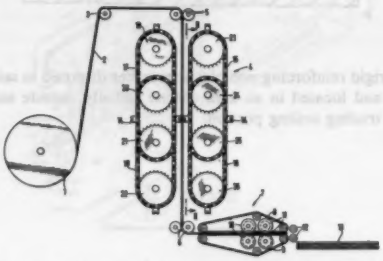
e. means associated with said first and second mold means for selectively holding said male portion and said second mold surface in simultaneous engagement with said film for a predetermined time and under a predetermined pressure whereby said protuberance and second mold surface portion produce a weakened rupture area in said film of less thickness than the film area adjacent said less thickness area and interposed between said first and second mold surfaces.

4,061,458

APPARATUS FOR PROCESSING A WEB OF MATERIAL WITHOUT A STANDSTILL

Friedhelm Mundus, and Horst Schneider, both of Lengerich, Germany, assignors to Windmoller & Holscher, Lengerich, Germany

Filed July 9, 1976, Ser. No. 703,934
Claims priority, application Germany, July 9, 1975, 2530636
Int. Cl.² B29C *17/00*
U.S. Cl. 425—392 **8 Claims**



1. Apparatus for processing a moving web of material without a standstill at positions disposed at particular longitudinal intervals, comprising a plurality of tool carriers adapted to accept operative tools for performing said processing on said web which are guided in opposing pairs on endless chains arranged in front of and behind and on both sides of a planar processing path determined by the moving web and wherein a said opposing pair of guided tool holders are located in front of and behind said planar path and each pair serving to attach an opposing operative tool disposed transversely of the web and enclosing the web therebetween, the tool carriers being guided in endless circulating paths, characterised in that the semi-circular guide path curves (40) of the circulating paths, which curves are connected by rectilinear guide path sections entering at a tangent, are displaceable and settable relatively to one another to change their lengths said tool carriers (14) being movable along the circulating paths by juxtaposed parallel and overlapping endless chains (15, 16) guided over sprockets (23 to 26) of which the shafts (23.1 to 26.1) are relatively displaceable and settable in pairs in a manner corresponding to the displaceable portions of the circulating paths, the runs of the chains extending in one plane or at the same elevation at the zone of overlap, that the link pins or lugs of the chains are provided with extensions (28) which, in the overlapping section, are directed towards one another and leave a gap between each other, and said tool carriers (14) moving in circulating paths have at least two receptacles (30) engaging a corresponding number of successive extensions in the overlapping section, at the start of which the extensions (28) of one chain enter the receptacles (30) and at the end of which the extensions (28) of the other chain leave same.

4,061,459

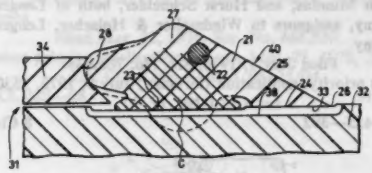
COMBINED MOLD ELEMENT AND SEALING RING

Gunnar Parmann, 5076 Alvoy, Norway

Continuation-in-part of Ser. No. 608,758, Aug. 28, 1975, Pat. No. 4,030,872. This application Feb. 7, 1977, Ser. No. 766,516
Int. Cl.² B29C *17/02*
U.S. Cl. 425—403 **15 Claims**

12. A combined mold element and sealing ring comprising an annular body of elastically yieldable material, said body having an inner peripheral surface defining at least one radially inwardly protruding sealing portion, an outer

peripheral surface having an outer radially directed surface portion, and a nose portion one one side; and



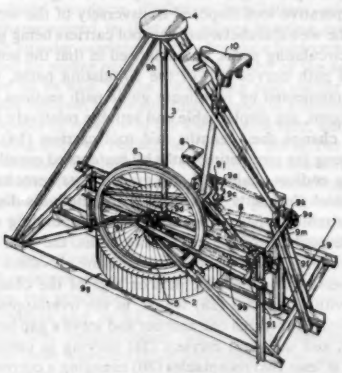
a rigid reinforcing non-elastic member disposed in said body and located in an area spaced radially outside said protruding sealing portion.

4,061,460

PEDAL POWERED POTTER'S WHEEL

John George, Box 625, Rte. 11, Tucson, Ariz. 85706

Filed July 6, 1976, Ser. No. 702,685
Int. Cl.[2] B28B *1/02*
U.S. Cl. 425—459 2 Claims



1. A pedal powered potter's wheel comprising in combination:

a. a frame;

b. a hollow, rubber flywheel containing water and air rotatably mounted within said frame about a vertical axis, the greatest bulk weight of said flywheel located toward the outer edge thereof;

c. a wheelhead shaft rotatably mounted within said frame along said vertical axis, said shaft being removably attached to a potter's wheelhead at its upper end and a rotatable means at its lower end;

d. a bicycle power drive wheel rotatably mounted within said frame about a horizontal axis such that the outer portion of said drive wheel pressingly contacts an upper portion of said flywheel at a 90° angle, and;

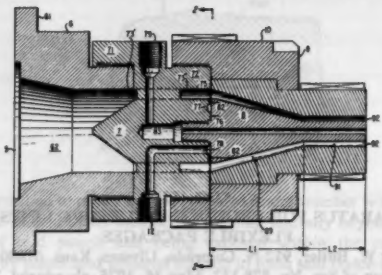
e. means including foot pedals on said drive wheel for actuating said drive wheel and in turn rotating said flywheel, wheelhead shaft and potter's wheel.

4,061,461

COMPOUND EXTRUSION DIE FOR PRODUCING AN INTERNALLY LINED EXTRUDATE

Herbert C. Hessenthaler, Bridgewater, N.J., assignor to Thermoplastice Processes Inc., Stirling, N.J.

Filed May 10, 1976, Ser. No. 684,500
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—462 8 Claims



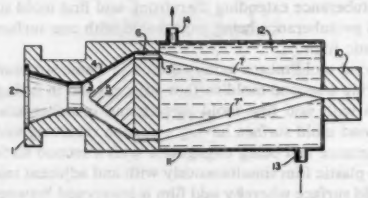
1. An extrusion die for producing a bonded extrudate of two thermoplastic materials comprising a main extrusion passageway having an annular cross-section for transporting a first extrudate stream and an increasingly constricted conical passageway joining said main passageway, a radial orifice intermediate and orthogonal to said main and said conical passageway for injecting a secondary extrudate onto the inside of said first extrudate stream, said radial orifice being positioned adjacent the upstream end of said conical passageway and an afterthroat passageway of substantially constant cross-sectional throat size downstream of said conical passageway.

4,061,462

APPARATUS FOR EXTRUDING THERMOPLASTIC MATERIAL

Giancarlo Giannarelli, Milan, and Walter Movilli, Bollate (Milan), both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed June 16, 1975, Ser. No. 586,910
Claims priority, application Italy, June 17, 1974, 24029/74
Int. Cl.[2] B29F *3/00*
U.S. Cl. 425—464 3 Claims



1. An extrusion machine for producing plates of thermoplastic material, said machine having an extrusion head with a molten material outlet zone shaped as a circular crown and a die member for plates; a set of separated tubes, one end of each tube being in fluid tight communication with said outlet zone of said circular crown and the opposite ends of the tubes being gathered on a same median line and in fluid tight communication with the die member, whereby molten material is transferred from said outlet zone to said die member in said tubes, the length and interior cross-section of the tubes being such that a constant pressure drop in molten material is produced in each tube, said set of tubes being immerged in a thermoregulated bath interposed between said extrusion head and said die member.

4,061,463

COMBUSTION SYSTEM AND METHOD

Henry J. Bennett, Palos Park, Ill., assignor to Burdett Manufacturing Company, Bridgeview, Ill.

Filed Dec. 12, 1975, Ser. No. 640,260
Int. Cl.[2] F23M 9/06
U.S. Cl. 431—9 13 Claims

1. A combustion system adapted to heat an enclosure, said system comprising:

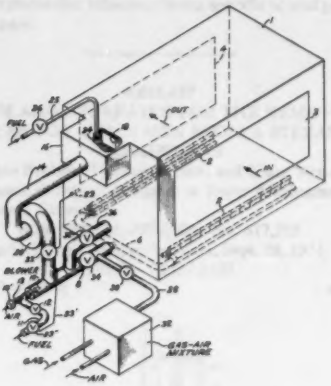
combustion burner means for supplying heat to said enclosure,

first conduit means connected to said burner means for supplying a combustible mixture of an oxidizing gas and fuel to said burner means,

injection means for discharging finely atomized liquid fuel to said first conduit means,

second conduit means between said enclosure and said first conduit means for supplying heated oxidizing gas from said enclosure to said first conduit means adjacent said injection means,

control means for controlling the temperature and quantity of the oxidizing gas supplied from said second conduit means such that the oxidizing gas vaporizes the liquid fuel atomized by the injection means and forms said combustible mixture, and



heating means for supplying additional heat to the gas passing from said enclosure to said second conduit means.

4,061,464

PROCESS FOR THE PREPARATION OF DYESTUFF COMPOSITIONS

Manfred Hahnke, Kelkheim, Taunus; Kurt Hohmann, Neu-Isenburg, and Theodor Papenfuhs, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 443,306, Feb. 19, 1974, abandoned.
This application Oct. 7, 1975, Ser. No. 620,385
Claims priority, application Germany, Dec. 15, 1973, 2362510
Int. Cl.² C09B 67/00
U.S. Cl. 8—79 2 Claims

1. A process for the preparation of liquid or pasty dyestuff composition containing 10 to 50% by weight of a basic nitro dyestuff which is present in the form of its free dyestuff base and carries a primary, secondary or tertiary amino group or a guanidino or hydrazino group, and containing 50 to 80% by weight of a non-ionic surface-active agent which process comprises synthesizing the dyestuff in the surface-active agent.

4,061,465

CREASABLE DURABLE PRESS TEXTILES FROM METHYLOL REAGENTS AND HALF AMIDES OR HALF SALTS OF DICARBOXYLIC ACIDS

William E. Franklin; John P. Madacsi, and Stanley P. Rowland, all of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 2, 1976, Ser. No. 673,015
Int. Cl.² D06M 13/40
U.S. Cl. 8—185 28 Claims

1. A process for imparting to cellulosic textiles improved properties of resilience, smooth drying, permanent creasability, and acidic character, the process comprising:

a. impregnating a cellulosic fabric with an aqueous solution containing a mixture having a ratio of about from 12:1 to 0:33:1 of a methylol crosslinking reagent and an amic acid of the general structure

where n is 2 or 3 and R is a hydrogen or an alkyl group wherein said R is the same or different from the other R groups, wherein the middle carbon atoms may be joined by a double bond or constitute part of a cyclic structure, and wherein the two functional groups in the same molecule must be able to approach each other closely; and

b. drying and curing the wet impregnated cellulosic fabric at a high temperature.

4,061,466

BIOLOGICALLY ACTIVE COMPOSITION AND THE USE THEREOF

Ingvar Gösta Holger Sjöholm, Tallmovagen 14, S-752 45, Uppsala; Nils Roger Lindmark, Glimmervagen 9 B, S-752 41 Uppsala, and Bo Magnus Ekman, Granitvagen 6 B, S-752 43 Uppsala, all of Sweden

Filed Oct. 14, 1975, Ser. No. 621,888
Claims priority, application Sweden, Oct. 16, 1974, 7412990; Oct. 16, 1974, 7412992; Oct. 16, 1974, 7412993
Int. Cl.² G01N 33/16, 31/14
U.S. Cl. 23—230 B 11 Claims

4. A process for carrying out a bioassay for quantitatively determining a particular substance in a biological sample comprising adding to said sample a reagent comprising of a biologically active composition comprising

a. microporous, spherical particles in gel form, said particles having a three-dimensional polymeric network, diameters less than 10 μm and an average diameter of from 0.5 to 4 μm and

b. a biologically active macromolecular substance immobilized within the meshes of said polymeric network but retaining its biological activity, said biologically active macromolecular substance being specific to said particular substance.

4,061,467

PROCESS AND APPARATUS FOR THE REMOVAL OF SAMPLES FOR ANALYSERS FROM A STREAM OF EXHAUST GAS

Wolf-Jürgen Becker; Wolfram Breuer, and Klaus Siemer, all of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 26, 1975, Ser. No. 617,219
Claims priority, application Germany, Sept. 28, 1974, 2446404
Int. Cl.² G01N 1/22
U.S. Cl. 23—232 R 4 Claims

1. A method for the removal of samples for the purpose of analysis from a stream of exhaust gas, wherein the stream of exhaust gas is diluted with a carrier gas which is free from the gas to be analysed before the sample is removed from the stream of exhaust gas.

4,061,468

STABLE TEST STRIPS HAVING A WATER-SOLUBLE PAPER LAYER AND METHODS FOR MAKING SAME

Hans Lange, Lampertheim; Walter Rittersdorf; Hans-Georg Rey, both of Mannheim-Waldhof; Wolfgang Werner, Mannheim-Vogelstang, and Peter Rieckmann, Mannheim-Waldhof, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed July 1, 1975, Ser. No. 592,295
Claims priority, application Germany, July 30, 1974, 2436598
Int. Cl.² G01N 31/22, 33/16
U.S. Cl. 23—253 TP 13 Claims

1. Stable test strip for the detection of a component in an aqueous liquid comprising two indicator layers containing at least one reagent in each layer, said reagents forming, upon contact with the liquid containing said component, a color detectable throughout said strip, wherein one of said indicator layers is a water soluble paper.

13. Process for the production of stable test strips for the detection of component materials in an aqueuous liquid, which comprises impregnating two indicator layers individually, each with at least one detection reagent, one of said indicator layers

being a water-soluble paper, drying said layers and uniting same to form said test strip.

4,061,469

CALIBRATION IN A BLOOD ANALYZER

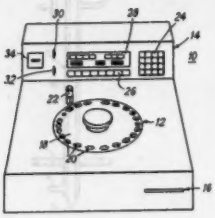
Charles Ray DuBose, Stafford, Tex., assignor to Hycel, Inc., Houston, Tex.

Filed Dec. 8, 1975, Ser. No. 638,472

Claims priority, application United Kingdom, Dec. 6, 1974, 52815/74; Dec. 6, 1974, 52810/74; Dec. 6, 1974, 52811/74; Dec. 6, 1974, 52812/74; Dec. 6, 1974, 52813/74; Dec. 6, 1974, 52814/74

Int. Cl.[2] G01N *33/16, 21/24*

U.S. Cl. 23—253 R 10 Claims



1. In a spectrophotometric measuring system for analyzing the concentration of a substance in a sample as a function of optical density of the sample, calibration means comprising first and second photodetectors positioned for respectively receiving radiant energy of a source and radiant energy applied from the source through a sample; ratio means connected to said photodetectors for providing an output as a function of the ratio of the outputs of said first and second detectors; a programmable voltage source; summing amplifier means having outputs from said ratio circuit and from said programmable voltage source coupled thereto for summing the outputs thereof, measuring means for measuring an output indicative of the output of said summing amplifier; a progammable gain amplifier coupled between said programmable voltage source and said measuring means; control means connected to said measuring means, and providing outputs coupled to program said programmable voltage source and said programmable gain amplifier; blank mode selection means for selection in correspondence with placing of a blank sample between said source and said second photodetector for connecting said control means for setting gain of said programmable gain amplifier at a preselected level and for providing a programming signal to said programmable voltage source; said control means further comprising blank level means for providing a value indicative of a desired blank level; means for comparing the output of said summing means to the output of said blank level means and for providing the programming signal to reduce the error between the value and the output of said summing means below a predetermined level, and means for holding and applying said programming signal to said programmable voltage source in an operate mode in which an unknown sample is placed between the source and said second photodetector.

4,061,470

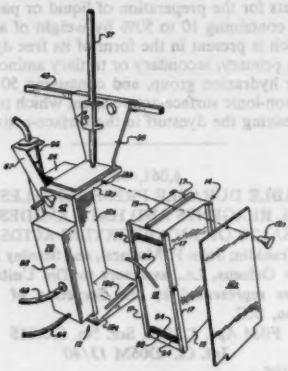
BLOOD OXYGENATOR UTILIZING A REMOVABLE MEMBRANE OXYGENATOR UNIT

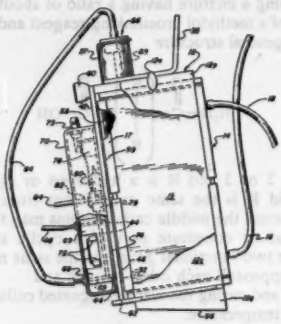
Ronald J. Leonard, Elk Grove Village, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 622,184, Oct. 14, 1975, abandoned, which is a division of Ser. No. 435,143, Jan. 14, 1974, Pat. No. 3,929,414. This application Oct. 27, 1976, Ser. No. 735,863

Int. Cl.[2] A61M *1/03*

U.S. Cl. 23—258.5 M 6 Claims





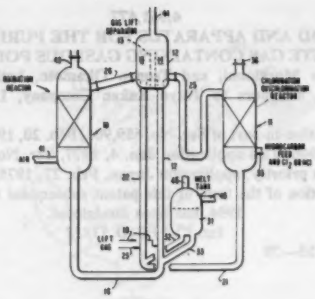
1. A blood oxygenator defining a blood flow path and an oxygen flow path in a manner which allows the blood flowing therethrough to be oxygenated comprising: a membrane defining an interface between the oxygen flow path and the blood flow path; a housing for holding said membrane, said housing defining said blood flow path on one side of the membrane and the oxygen flow path on the other side of the membrane, said blood and oxygen flow paths being sealed from one another, said housing defining inlets and outlets for each of said oxygen and said blood flow paths; a bracket means for removably engaging and holding said housing in a predetermined disposition, said bracket means further comprising a means for at least partially shielding said oxygen outlet from external obstruction and for dispersing oxygen passing from the oxygen outlet of said housing into a plurality of directions to prevent accidental obstruction of said outlet.

4,061,471

MOLTEN SALT LIFT GAS SYSTEM FOR PRODUCTION OF CHLORINATED HYDROCARBONS

Morgan C. Sze, Upper Montclair, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Nov. 19, 1975, Ser. No. 633,491
Int. Cl.[2] B01J *8/12, 8/18, 8/26;* C07C *21/02*
U.S. Cl. 23—260 2 Claims



1. An apparatus for producing chlorinated hydrocarbons by the use of molten salts, comprising:

an oxidation reactor including an inlet and outlet for oxidizing molten salts;

a chlorinated hydrocarbon production reactor including an inlet and outlet for producing chlorinated hydrocarbons;

a first lift gas separating means;

a first lift gas pipe connecting the lower portion of the oxidation reactor with the first lift gas separating means, said first lift gas pipe including means for introducing a lift gas therein for passing molten salt from the oxidation reactor to the first lift gas separating means;

a second lift gas separating means;

a second lift gas pipe connecting the lower portion of the chlorinated hydrocarbon production reactor with the second lift gas separating means, said second lift gas pipe including means for introducing a lift gas therein for passing molten salt from the chlorinated hydrocarbon reactor to the second lift gas separating means;

first pipe means connecting the first lift gas separating means with an upper portion of the chlorinated hydrocarbon production reactor for passing molten salt from the first lift gas separating means into the chlorinated hydrocarbon production reactor;

a second pipe means for connecting the second lift gas separating means with an upper portion of the oxidation reactor for passing molten salt from the second lift gas separating means into the oxidation reactor; and

a pressurized melt storage tank, including a third pipe means connecting the pressurized melt storage tank with the bottom of the first lift gas pipe, a fourth pipe means connecting the pressurized melt storage tank with the bottom of the second lift gas pipe, and means for introducing and withdrawing a gas under pressure to control the pressure in the melt storage tank and thereby control the flow rates of the molten salt, and normally prevent flow of molten salt between the melt storage tank and the first and second lift gas pipes.

4,061,472

PROCESS FOR PRODUCING SYNTHETIC CAKING COAL AND BINDER PITCH

Hiromi Ozaki, Uraws; Mamoru Yamane, Kiyose; Hachio Kodama, Toda, and Haruo Yoshika, Hoya, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 455,363, March 27, 1974, abandoned. This application July 25, 1975, Ser. No. 599,085
Claims priority, application Japan, Mar. 27, 1973, 48-34066; Apr. 10, 1973, 48-40049; Apr. 26, 1973, 48-46687; Oct. 6, 1973, 49-111951
Int. Cl.[2] C10L *9/04;* C10C *1/00, 3/00*
U.S. Cl. 44—1 R 6 Claims

1. A raw synthetic caking coal prepared by thermally cracking a heavy hydrocarbon selected from the group consisting of petroleum atmospheric oil, vacuum residual oil, cracked residual oil, catalytically cracked oil, and propane asphalt at a temperature of from 380° to 500° C, which composition is characterized by a volatile matter content of from 25.2 to 60.7 percent, an atomic ratio of H/C of 0.60 to about 1.20 and a maximum fluidity greater than 40 ddpm.

5. A synthetic caking coal is which is useful as a raw material in the production of metallurgical coke which is characterized by volatile matter content of 21.9 39.6% H/C (atomic ratio) of 0.60 - 0.75 a maximum fluidity above 40 ddpm and a free-swelling index of greater than 3 which is produced by stripping the raw synthetic caking coal of claim 1 with steam or a light hydrocarbon.

4,061,473

PROCESS TO EMBODY WASTE AUTOMOTIVE LUBRICATING OILS INTO A FUEL ADDITIVE TO REDUCE CORROSION AND DEPOSITS AND AUGMENT ENERGY AVAILABILITY

Robert S. Norris, 72 Pondfield Road West, Apt. 1-F, Bronxville, N.Y. 10708

Filed Aug. 21, 1975, Ser. No. 606,710
Int. Cl.[2] C10L *1/32*
U.S. Cl. 44—51 16 Claims

1. A process of preparing a fuel oil additive comprising emulsifying a waste lubricating oil containing petroleum sulfonate detergent with an aqueous solution of a water soluble salt of an element selected from the group consisting of aluminum, barium, boron, calcium, chromium, copper, magnesium, manganese, samarium, silicon, tin and zinc.

4,061,474

PHENOXIDE-HALO CARBOXYLIC ACID CONDENSATE ADDITIVES FOR FUELS

Thomas Frier Steckel, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Filed Aug. 27, 1975, Ser. No. 608,291
Int. Cl.[2] C10L *1/18, 1/32, 1/22;* C10M *1/54*
U.S. Cl. 44—66 12 Claims

1. A normally liquid fuel composition comprising a major amount of a normally liquid fuel and about 1-10,000 parts per million parts by weight of fuel of a product made by reacting at least one (I) metal phenoxide substituted with at least one hydrocarbon group of at least about 30 carbon atoms with (II) a carboxylic acid reagent containing from 1 to 3 Cox groups and a halogen-substituted hydrocarbon aliphatic or alicyclic group, the ratio of equivalents of acid reagent to equivalents of phenoxide ranging between about 1:5 to about 5:1, wherein each Cox independently represents a member selected from the group consisting of a carboxylate of a Group IA metal, a carboxylic ester of a lower alkanol, a carboxamide of lower alkyl monoamines or ammonia, and a carboxylate of a lower alkyl monoamine or ammonia.

4,061,475

PROCESS FOR PRODUCING A GAS WHICH CAN BE SUBSTITUTED FOR NATURAL GAS

Friedrich-Wilhelm Moller, Friedrichsdorf; Karl Bratzler, Bad Homburg, and Wolf-Dieter Müller, Nieder-Eschbach, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 592,301, July 1, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 773,109

Claims priority, application Germany, July 9, 1974, 2432887

Int. Cl.² C10J *3/00;* C10K *3/02*

U.S. Cl. 48—197 R 2 Claims

1. A process for producing a high-methane gas which can be substituted for natural gas, from a primary gas containing 35–44% by volume hydrogen, 15–20% by volume carbon monoxide and 28–32% by volume carbon dioxide produced by the gasification of coal with water vapor and oxygen under a pressure of 20–80 kg/cm² comprising the steps of:

a. purifying said primary gas by removing catalyst poisons and removing carbon dioxide to a residual content below 2% by volume;

b. adjusting the water vapor to carbon monoxide volume ratio of the scrubbed gas to 0.55 : 1 to 1 : 1;

c. passing said gas of step (b) through one reaction zone containing only a methanation catalyst containing 20–60% by weight of nickel on a support which is resistant to water vapor, the temperature of the gas entering said reaction zone being in the range of 300°–500° C and the temperature of the gas leaving the methanation catalyst being below 480° C;

d. supplying the gas leaving the reaction zone to a final methanation stage to produce a high-methane gas; and

e. removing residual carbon dioxide from said high-methane gas to produce said gas to be substituted for natural gas.

4,061,476

GAS PURIFICATION METHOD AND APPARATUS

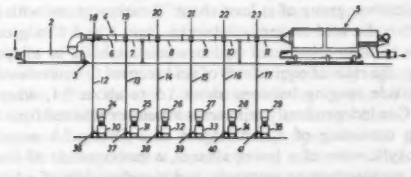
Heinz Hölter, Gladbeck; Heinz Gresch, Dormund-Derne, and Heinrich Igelbüscher, Gladbeck, all of Germany, assignors to Heinz Holter, Gladbeck, Germany

Filed May 4, 1976, Ser. No. 683,205

Claims priority, application Germany, May 6, 1975, 2520045; Dec. 9, 1975, 2555220; Mar. 4, 1976, 2608935; Apr. 10, 1976, 2615828

Int. Cl.² B01D *53/06*

U.S. Cl. 55—77 33 Claims



1. In a gas purification method wherein gas, containing at least one contaminant and/or noxious component, is contacted with a solid sorption agent which selectively attracts the contaminant and/or noxious component and is subsequently separated from the solid sorption agent, the improvement comprising introducing the solid sorption agent, in purverulent form, into the flowing stream of the gas and then subjecting such stream, containing the solid sorption agent, to intense turbulence, by diverting the stream outwardly by a cone and then inwardly by a frusto-conical ring, before separating the solid sorption agent therefrom.

4,061,477

METHOD AND APPARATUS FOR THE PURIFICATION OF WASTE GAS CONTAINING GASEOUS POLLUTANTS

Heiichiro Murakami, and Tsuneo Okamoto, both of Iwaki, Japan, assignors to Taiyo Kaken Company, Ltd., Tokyo, Japan

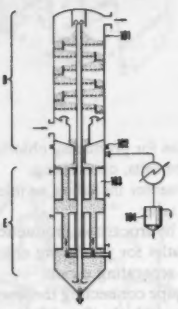
Continuation-in-part of Ser. No. 659,901, Feb. 20, 1976, Pat. No. 4,047,906. This application Jan. 4, 1977, Ser. No. 756,650

Claims priority, application Japan, Feb. 27, 1975, 50-24282

The portion of the term of this patent subsequent to Sept. 11, 1994, has been disclaimed.

Int. Cl.² B01D *53/12*

U.S. Cl. 55—79 15 Claims



1. A method for the continuous purification of a waste gas containing gaseous pollutants comprising:

providing a tower containing a plurality of vertically spaced perforated trays, each tray having a single weir, extending horizontally along a substantially straight line, provided on its upper surface disposed to divide its surface area into a first section having a plurality of apertures and constituting 80–95% of the total surface area of the tray and a second section having a plurality of apertures and constituting 5–20% of the total surface area of the tray, the location of the weirs on the various trays alternating from side to side in the tower;

continuously introducing said waste gas upwardly into a lower section of said tower and at the same time continuously introducing activated carbon spheres into an upper section of the tower for contact with said waste gas thereby forming a fluidizedbed on said first section of each of said trays; and

continuously removing purified gas from the top of said tower.

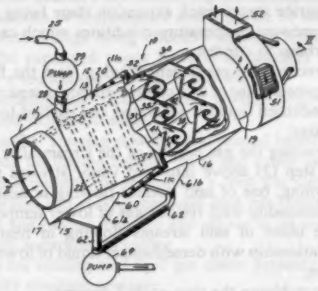
8. A chemical process column containing a plurality of vertically-spaced perforated trays, each of said trays having a single weir, extending horizontally along a substantially straight line, provided on its upper surface to divide its upper surface into first and second sections, each of said tray sections having a plurality of perforations, and said first tray section having a surface area constituting 80 to 95% of the total tray surface area.

4,061,478

SELF-CLEANING SMOKE FILTER

George J. Hartwick, 3733 N. Sheridan Road, Waukegan, Ill. 60085

Continuation-in-part of Ser. No. 484,285, June 28, 1974, abandoned. This application May 28, 1975, Ser. No. 581,531
Int. Cl.[2] B01D *47/06*
U.S. Cl. 55—257 PV 18 Claims



1. A channel for removing contaminants from gases having an input port adapted to receive said gases, and an exit port adapted to expel said gases; said channel comprising

a first pair of adjacent longitudinal sides forming a V-shaped bottom portion in said channel, and a second pair of adjacent longitudinal sides forming an inverted V-shaped top portion in said channel;

liquid dispensing means disposed between said input port and said exit port for subjecting said gases to a liquid stream to wet said contaminants;

baffle means disposed within said channel between said liquid dispensing means and said exit port for simultaneously passing said gases to said exit port and trapping said wet contaminants; said baffle means defining downwardly extending gutter means for carrying said wet contaminants trapped by said baffle means toward said bottom portion of said channel; said baffle means having a first row comprising: a first baffle having a straight section extending from one of said longitudinal sides comprising said top portion, and a first curled section looping back relative to said straight section; a second baffle having a first L-shaped section in spaced relationship from said curled section, and a second curled section looping back relative to said first L-shaped section; a third baffle having a second L-shaped section in spaced relationship from said second curled section, and a third curled section looping back relative to said second L-shaped section; and a fourth baffle comprising an end section extending from the other longitudinal side comprising said top portion;

trough means, secured to one of said first pair of adjacent sides, cooperating with said gutter means for receiving said contaminants; and

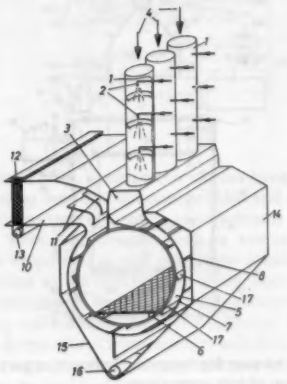
drain means, disposed in said bottom portion, cooperating with said trough means for carrying off said contaminants, thereby preventing buildup of said contaminants inside said channel.

4,061,479

APPARATUS FOR AND METHOD OF SEPARATING DROPLETS OF A LIQUID FROM A GAS

Heinz Hölter, and Heinrich Igelbuscher, both of Gladbeck, Germany, assignors to Heinz Holter, Gladbeck, Germany

Filed Nov. 26, 1976, Ser. No. 745,304
Claims priority, application Germany, Nov. 29, 1975, 2553856; May 29, 1976, 2624187
Int. Cl.[2] B01D *47/00*
U.S. Cl. 55—257 C 7 Claims

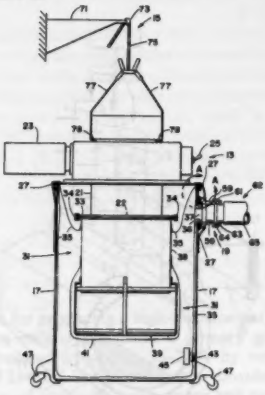


1. Apparatus for separating liquid droplets from a gas, comprising an elongate cylindrical chamber having a generally horizontal axis and including a continuous interior wall and a closely spaced coaxial continuous exterior wall, the exterior wall having annularly spaced longitudinal slits substantially parallel to the chamber axis through which liquid carried by the gas may pass out as the gas flows around the chamber, elongated inlet and outlet manifolds annularly spaced apart along the circumference of said chamber, each said manifold having an opening into said chamber of approximately the cross sectional area of the chamber and smaller than the cross section of the manifold and extending along substantially the entire length of and parallel to the chamber axis, a plurality of inlet ducts, for gas under pressure, having axes radial to said chamber and connected to said inlet manifold one after another substantially its full length, each of said ducts housing spray jet means for mixing wash water with incoming gas, and baffle means in said inlet manifold for changing the direction of flow of the incoming gas from a direction radial of the chamber to a direction tangential to the chamber as the incoming gas enters the chamber through said opening in the inlet manifold, whereby incoming gas under pressure mixed with wash water will flow through the inlet ducts into the inlet manifold, strike the baffle means and change from radial direction to enter the chamber tangentially through the inlet manifold opening, flow circumferentially around the chamber in a stream of greater velocity having no stratification and little or no movement longitudinally of the chamber, while liquid droplets are efficiently separated from the stream through said slits, and finally emerge from the chamber through the outlet manifold.

4,061,480
VACUUM CLEANER FOR RADIOACTIVELY CONTAMINATED PARTICLES

Burton L. Frye, Napa, Calif.; Max G. Pittman, Kahlotus, Wash.; David A. Runge; Lawrence C. Souza, both of Petaluma, Calif., and Raymond V. LaVoie, Sonoma, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 20, 1976, Ser. No. 688,456
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—356 **9 Claims**



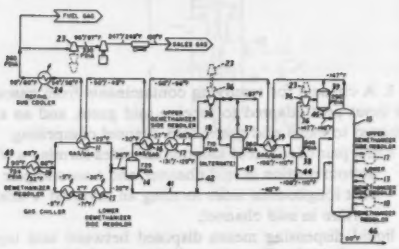
1. A vacuum cleaner for removing radioactive particles from the surface of an object comprising:
   a. an upper housing having an exhaust port;
   b. a lower housing having an input port;
   c. means for sealably connecting said upper housing to said lower housing in an airtight manner;
   d. a suction means, having an intake opening and an exhaust opening connected to said exhaust port, for creating a local pressure differential, said suction means being fixedly contained in said upper housing;
   e. a filter container having two openings and containing a material capable of filtering very fine particles, one opening of said container being removably attached to said intake opening of said suction means;
   f. a retainer of a flexible material located in said lower housing, said retainer having a central opening, a fold concentric with said central opening, and a port opening, said central opening being attached annularly to the side of said filter container in an airtight manner such that the second opening of said filter container is enclosed by said retainer, said port opening being removably attached in an airtight manner peripherally to said input port of said lower housing, and said fold being peripherally held by the interface of said upper and said lower housings;
   whereby ambient air containing radioactive particles enters said retainer through said port opening and is filtered by said filter container so that the radioactive particles are retained in said retainer without contaminating said vacuum cleaner.

4,061,481
NATURAL GAS PROCESSING

Roy E. Campbell; John B. Lawrence, and Ronald Ray Tonne, all of Midland, Tex., assignors to The Ortloff Corporation, Midland, Tex.

Continuation of Ser. No. 516,993, Oct. 22, 1974, abandoned.
This application Sept. 15, 1976, Ser. No. 723,513
Int. Cl.[2] F25J *3/02*
U.S. Cl. 62—29 **10 Claims**

1. In a process for obtaining a liquified fraction from a main stream of gas containing hydrocarbons selected from the group consisting of natural gas, refinery gas streams, and synthetic gas streams obtained from coal, crude oil, naphtha, oil shale, tar sands, and lignite which comprises the steps of
   a. removing carbon dioxide, sulfur-containing gases, and other undesirable contaminants;
   b. dehydrating the gas stream;
   c. expanding said gas stream to a pressure lower than the previously existing pressure while extracting energy from the gas to provide a stream comprising gas and liquid portions; and
   d. separating the resulting cold stream into residue gas and liquid portions,
   the improvement consisting in the steps of:
   1. expanding said gas stream in step (c) in at least two separate stages, each expansion stage being conducted at pressure-temperature conditions which cause hydrocarbons to condense;
   2. directing the gas stream flowing from the first of said expansion stages to a condensed liquid separator where condensed liquid is separated and carried to a demethanizer;
   3. directing the gas portion of the stream after separation in step (2) above into two vapor streams for further cooling, one of said streams flowing in heat exchange relationship with residue gas of lower temperature and the other of said streams flowing in heat exchange relationship with demethanizer liquid of lower temperature;
   4. recombining the thus-cooled streams;
   5. separating the liquid condensed by said further cooling step;



   6. carrying the condensed liquid to a demethanizer;
   7. directing the gas portion of the stream obtained in (5) above to the next expansion stage;
   8. separating the stream leaving the said next expansion stage into gas and liquid portions;
   9. directing the gas portion, from the separation following said next expansion stage, together with discharge gas from the demethanizer, into heat exchange relationship with at least one of the two vapor streams in (3) above; and
   10. directing the liquid portion obtained in (8) above to a demethanizer.

2. In a process for separating a feed gas into a liquid product portion and a residue gas, said feed gas containing hydrocarbons and having methane and ethane as its major components, said process including the steps of
   a. cooling said feed gas under substantially constant pressure;
   b. expanding at least a portion of said cooled gas stream to a lower pressure while extracting energy from said gas portion to provide a partially condensed cold stream; and
   c. treating at least the resulting partially condensed cold stream in a distillation column at said lower pressure to obtain said liquid product portion,
   the improvement wherein said gas stream portion is expanded in step (b) in at least two separate stages by a process wherein
   1. said portion of said cooled gas stream under pressure (a)

is expanded in a first expansion means to an intermediate pressure while extracting energy from the gas, the outlet conditions of temperature and pressure in said first expansion stage being effective to cause the expanded feed gas portion to partially condense;

2. further cooling at least the gas remaining from said partial condensation immediately following said expansion in step (1) at a substantially constant pressure at said intermediate pressure;
3. separating said further cooled gas into a first vapor fraction at intermediate pressure and a first liquid fraction;
4. further expanding said first vapor fraction at said intermediate pressure in a second expansion stage, the outlet conditions of temperature and pressure in said second expansion stage being effective to cause hydrocarbons in the expanded vepor fraction to partially condense into a second gas and liquid portion;
5. separating said second liquid portion following said second expansion stage; and
6. thereafter treating said first and second liquid fractions in said distillation column (c) at said lower pressure.

10. In an apparatus for separating a feed gas into a liquid product portion and residue gas, said feed gas containing hydrocarbons and having methane and ethane as its major components, said apparatus including

a. means for cooling said feed gas under pressure at a substantially constant pressure;
b. expansion means connected to said cooling means to receive at least a portion of said cooled feed gas under pressure and to expand said gas portion to a lower pressure while extracting energy therefrom, said expansion means being adapted to partially condense said gas portion and to provide a cold gas stream; and
c. distillation means connected to said expansion means for receiving at least said partly condensed cold gas stream at said lower pressure, said distillation means being adapted to produce said liquid product portion,

the improvement wherein said expansion means (b) comprises

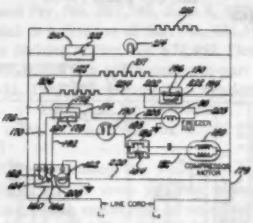
1. a first expansion means for expanding said gas stream portion to a pressure intermediate between the pressure of said feed gas and said lower pressure while extracting energy from the gas, said first expansion means being adapted to provide outlet conditions of temperature and pressure effective to cause hydrocarbons to partially condense from the gas stream portion at said intermediate pressure;
2. further cooling means connected directly to receive at least the gas remaining in said partially condensed feed stream from said first expansion means for further cooling the stream flowing from said first expansion means at a substantially constant pressure;
3. separation means connected to said further cooling means to receive the partially expanded and further cooled gas stream at said intermediate pressure and to separate it into a first liquid portion and first vapor portion;
4. a second expansion means connected to said separation means to receive said first vapor portion and to further expand it while extracting energy therefrom, said second expansion means being adapted to provide outlet conditions of temperature and pressure effective to cause hydrocarbons to partially condense from the further expanded gas stream;
5. separation means for removing a second liquid portion from the further expanded gas following said second expansion stage; and
6. means to receive said first and second liquid portions and supply them to said distillation column (c) at said lower pressure.

4,061,482

COOLING COIL AND AIR DISTRIBUTION SYSTEM DEFROST MEANS

Robert Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 29, 1976, Ser. No. 745,551
Int. Cl.² F25D 21/08
U.S. Cl. 62—155 **3 Claims**



1. In combination, a refrigerator cabinet having an insulated above-freezing food storage compartment and a freezer food storage compartment therein, an evaporator compartment separated from said compartments, a source of electrical power, an evaporator in said evaporator compartment, a fan for circulating air via inlet conduit means from the food storage compartments in thermal exchange relationship past said evaporator, exit conduit means for returning the cooled air from said evaporator compartment to said food storage compartments, a compressor for supplying liquid refrigerant to said evaporator, an electrical defrost heater for periodically warming said evaporator to defrost temperatures, a defrost thermostat switch in said evaporator compartment for limiting the duration of the defrost periods, a temperature responsive cold control switch for energizing said compressor, a defrost timer switch for periodically energizing said heater defrosting said evaporator, said defrost timer means including a switch for selectively energizing either said compressor or said electric defrost heater means, the improvement wherein means for supporting said defrost thermostat for sensing the flow of air leaving said evaporator compartment, a control circuit electrically connecting one side of said defrost thermostat to one side of said power source and the other side of said defrost thermostat with one side of said defrost heater, said defrost heater means having its other side connected to a first fixed contact of said defrost timer switch, said circuit means connecting one side of said fan with said other side of said defrost thermostat, said circuit means connecting the other side of said fan with a movable contact of said defrost timer switch, said defrost timer movable contact connected by said circuit control means through said cold control switch to the other side of said power source, a second fixed contact of said defrost timer connected by said circuit control through said compressor motor to said one side of said power source, whereby said fan is energized in unison with said defrost heater upon said defrost timer movable contact being moved into contact with said first fixed contact to start a defrost cycle, and whereby upon said defrost thermostat sensing an above-freezing temperature of air leaving said evaporator compartment after frost on said evaporator has melted said defrost thermostat deenergizes said defrost heater and said fan, said control circuit causing said fan to remain deenergized until said defrost thermostat senses a below-freezing temperature of air leaving said evaporator compartment after moisture remaining on said evaporator has been refrozen after defrost, thereby resulting in a minimum of moisture laden cooled air being circulated through said exit conduit means to obviate accumulated frost buildup therein and whereby the run time for said fan is minimized.

4,061,483

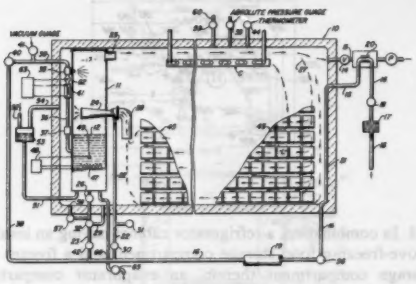
LOW TEMPERATURE HYPOBARIC STORAGE OF METABOLICALLY ACTIVE MATTER

Stanley P. Burg, Miami, Fla., assignor to Grumman Allied Industries Inc., Garden City, N.Y.

Division of Ser. No. 500,449, Aug. 26, 1974, Pat. No. 3,958,028, which is a continuation-in-part of Ser. No. 245,886, April 20, 1972, abandoned. This application Mar. 22, 1976, Ser. No. 669,167

Int. Cl.² F25B *19/00*

U.S. Cl. 62—268 38 Claims



1. Storage apparatus comprising an enclosed space, with walls constructed to withstand the force of a vacuum and adapted to receive and preserve metabolically active matter stored therein, means for evacuating said space, refrigeration means for maintaining a selected temperature within said space, means for admitting fresh air at a restricted rate into said space when said evacuaing means withdraws air therefrom and maintaining a flow of air through said space, water-humidifying means for humidifying said moving air, and means for maintaining the temperature of the water for said humidifying means not detrimentally less than the temperature of air in said space and maintaining a desired relative humidity in said space.

4,061,484

PROCESS FOR PRODUCING GRADIENT FIBERS

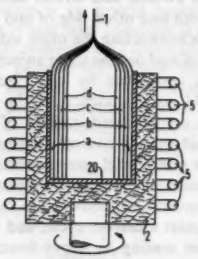
Hubert Aulich, Munich, and Josef Grabmaier, Kempfenhausen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 30, 1977, Ser. No. 782,951

Claims priority, application Germany, Apr. 4, 1976, 2614631

Int. Cl.² C03B *37/00*

U.S. Cl. 65—2 7 Claims



1. A process for producing a gradient glass fiber having a changing index of refraction radially comprising the steps of

A. introducing successively into the rotating, cylindrically-walled heated melting crucible a plurality of glass masses which differ from one another progressively as respects respective indices of refraction thereof, the glass mass introduced initially having the smallest index of refraction of said plurality and the glass mass introduced last having the greatest refractive index of said plurality, so that each individual such glass mass forms a successive cylindrical layer on said cylindrical crucible walls, and

B. pulling a glass fiber having a radially changing index of refraction from the resulting heated cylindrically layered glass structure.

4,061,485

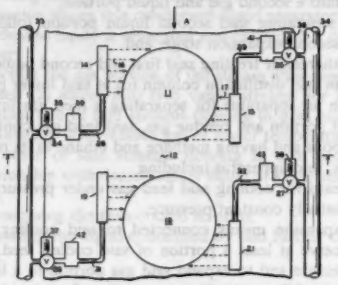
METHOD OF AND APPARATUS FOR CONTROLLING THE DISTRIBUTION OF FIBERS ON A RECEIVING SURFACE

Carl F. Rimmel, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 582,464, May 30, 1975, abandoned. This application Oct. 27, 1976, Ser. No. 736,013

Int. Cl.² C03B *37/04*

U.S. Cl. 65—4 R 21 Claims



3. In apparatus for forming glass fibers wherein said fibers are projected as a hollow tubular formation from the forming means toward a collecting surface, said formation being distributed upon the collecting surface through the interaction of said veil and intersecting on-off pulsating jets of gas the improvement comprising adjustable control means for independently controlling the cycle frequency and the ratio of the on to off periods during a cycle.

4,061,486

PROCESS FOR THE MANUFACTURE OF OPTICAL BODIES WITH REFRACTIVE INDEX GRADIENTS

Walter Jahn, Ingelheim, Germany, assignor to JENAer Glaswerk, Schott & Gen., Mainz, Germany

Filed Feb. 19, 1976, Ser. No. 659,258

Claims priority, application Germany, Feb. 19, 1975, 2507069

Int. Cl.² C03B *23/20*; C03C *15/00*

U.S. Cl. 65—18 6 Claims

4. A process for producing a transparent optical-glass body having a linear index of refraction gradient, said process comprising the steps of:

I. pressing particles of optical glass to form a self-supporting porous body of optical glass of the following composition by weight percent:

SiO_2	10 to 50
R_2O	2 to 30
B_2O_3	0 to 5
Al_2O_3	0 to 5
PbO	balance to make 100%

wherein R is an alkali metal,

II. sintering the body without substantially reducing the porosity,

III. applying a temperature gradient to change continuously the pore distribution,

IV. immersing the body into a penetrating medium, and

V. heating the porous optical-glass body to a temperature of

550°–700° C to eliminate the pores and give a transparent optical glass body having an index of refraction gradient such that the part of the glass with a higher temperature has a lower index of refraction than the part of the glass with a lower temperature.

5. A process for producing a transparent optical-glass body having an index of refraction gradient, said process comprising the steps of:

I. pressing particles of optical glass to form a self-supporting porous body of optical glass of the following composition by weight percent:

SiO_2	10 to 50
R_2O	2 to 30
B_2O_3	0 to 5
Al_2O_3	0 to 5
PbO	balance to make 100%

wherein R is an alkali metal,

II. leaching a first portion of the R_2O from a first part of the porous body and leaching a second portion of the R_2O from a second part of the porous optical-glass body,

wherein the first portion R_2O leached is greater than the second portion of R_2O leached;

III. heating the porous optical-glass body to a temperature of 550° to 700° C to eliminate the pores and give a transparent optical-glass body having an index of refraction gradient such that the index of refraction is greater in the second part of the glass body than the index of refraction in the first part.

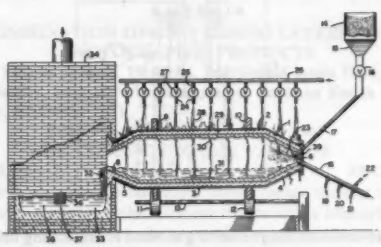
4,061,487
PROCESS FOR PRODUCING GLASS IN A ROTARY FURNACE

Kazuo Kiyonaga, Tarrytown, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 701,677, July 1, 1976, abandoned, which is a continuation of Ser. No. 519,188, Oct. 30, 1974, abandoned. This application Dec. 16, 1976, Ser. No. 751,196

Int. Cl.² C03B 5/16; F27B 14/00

U.S. Cl. 65—135 **12 Claims**



1. A continuous process for melting inorganic raw materials to produce molten glass in a generally cylindrical continuously rotating chamber comprising the following steps:

a. feeding the raw materials into the chamber;

b. providing a flame of high intensity heat produced by the combustion of fuel with a gas containing about 50 to about 100 percent by volume oxygen and directing the flame into the chamber in such a manner that the raw materials are melted; and

c. rotating said chamber at a sufficient speed and cooling the exterior of the chamber with a liquid coolant in such a manner that the inner surface of the chamber is coated with a layer of molten glass, the layer is solidified, and a solidified layer of glass is maintained throughout the process whereby the solidified layer essentially prevents impurities from the inner surface of the chamber from entering the melt; and

d. withdrawing molten glass.

4,061,488
PLANT TREATING MIXTURES AND METHODS UTILIZING SPORES OF *BACILLUS UNIFLAGELLATUS*

Elton W. Mann, Hershey, Pa., assignor to Hershey Foods Corporation, Hershey, Pa.

Continuation-in-part of Ser. No. 306,221, Nov. 13, 1972, abandoned, and Ser. No. 121,199, March 4, 1971, Pat. No. 3,819,829, and Ser. No. 367,749, June 4, 1973, Pat. No. 3,920,812, which is a division of Ser. No. 121,199, March 4, 1971, which is a division of Ser. No. 672,462, Oct. 3, 1967, Pat. No. 3,617,448, which is a continuation-in-part of Ser. No. 334,907, Dec. 31, 1963, abandoned. This application Sept. 18, 1973, Ser. No. 395,661

Int. Cl.² A01N 21/02, 15/00

U.S. Cl. 71—77 **38 Claims**

1. A method for increasing the yield of food crops which comprises treating a food crop yielding plant with a plant treating agent consisting essentially of an effective amount of spores of *Bacillus uniflagellatus* (ATCC No. 15,134), said spores being applied to the plant in such a manner that the spores will eventually come into contact with exudates produced by the roots of the plant, said plant being one which does not have a single large taproot, with no appreciable branching of the root.

13. A substantially uniform mixture of a blend consisting essentially of seeds of a plant which upon cultivation yields a food crop and an effective food crop yield-increasing amount of spores of *Bacillus uniflatellatus* (ATCC No. 15,134).

4,061,489
ABSCISSION COMPOSITIONS

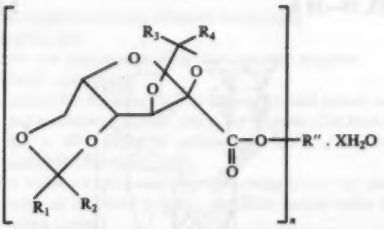
William Szkrybalo, Verona, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 347,035, April 2, 1973, abandoned. This application Feb. 11, 1975, Ser. No. 548,937

Int. Cl.² A01N 9/00

U.S. Cl. 71—88 **15 Claims**

1. An abscission composition comprising inert carrier material, and as an active abscission ingredient, an amount effective for abscission of a compound of the formula



wherein, when *n* is 1, R″ is hydrogen, sodium, potassium, ammonium, substituted ammonium wherein the substitutents are one or more of lower alkyl, lower alkenyl or hydroxy (lower alkyl), straight or branched chain alkyl of from 1 to 20 carbon atoms, straight or branched chain alkenyl of from 2 to 20 carbon atoms, straight or branched chain alkynyl of from 2 to 20 carbon atoms, or halo-lower alkyl and, when *n* is 2, R″ is calcium or lower alkylene; R_1, R_2, R_3 and R_4 are hydrogen, straight or branched chain alkyl of from 1 to 20 carbon atoms, straight or branched chain alkenyl of from 2 to 20 carbon atoms, straight or branched chain alkynyl of from 2 to 20 carbon atoms, halo-lower alkyl, phenyl or phenyl residue having one or more lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy or halo-loweralkoxy substituents thereon or R_1 and R_2 together and R_3 and R_4 together are each a saturated

ring containing from 3 to 8 carbon atoms; *n* is an integer from 1 to 2 and X is a number from 0 to 1; enantiomers and racemates.

4,061,490

POST-HARVEST PLANT PRESERVING COMPOSITIONS

Hisajiro Yukinaga, Kusatsu; Hideo Kano, Ibaraki, and Masaru Ogata, Kobe, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 432,889, Jan. 14, 1974, abandoned. This application Nov. 26, 1975, Ser. No. 635,449
Claims priority, application Japan, Jan. 18, 1973, 48-8065
Int. Cl.² A01N *3/02*
U.S. Cl. 71—68 **11 Claims**

1. A composition for preserving post-harvest plants which comprises, as active ingredient, from about 0.00001 to about 90 percent by weight of 2-benzimidoyl-3-hydroxy-1,4-naphthoquinone, and an agriculturally acceptable carrier therefor.

4,061,491

METHOD OF CONTROLLING WEED GROWTH IN RICE FIELDS WITH TRI-N-BUTYL TIN IMIDAZOLE

Friedrich Arndt, Berlin, and Hans Plum, Heessen, both of Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Filed Mar. 11, 1975, Ser. No. 557,285
Claims priority, application Germany, Apr. 18, 1974, 2419208
Int. Cl.² A01N *9/22, 9/00; C07F 7/22*
U.S. Cl. 71—92 **1 Claim**

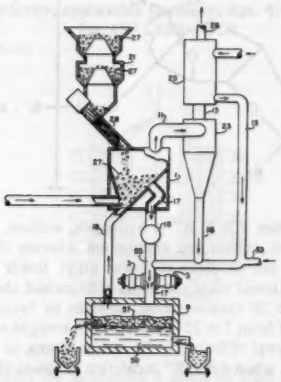
1. A method for the treatment of rice fields for the control of weed growth which comprises applying to the water surface of flooded rice fields from about 0.5 to about 10 kilograms per hectare of tri-n-butyl tin imidazole.

4,061,492

METHOD OF ORE REDUCTION WITH AN ARC HEATER

Maurice G. Fey, Pittsburgh, Pa., and Edna A. Dancy, Beaconsfield, Canada, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 553,401, Feb. 26, 1975, abandoned. This application June 23, 1976, Ser. No. 699,297
Int. Cl.² C21C *5/52*
U.S. Cl. 75—10 R **5 Claims**



1. In a process for producing a metal or an alloy comprising the steps of

a. partially reducing in an initially fresh supply of reducing gas in a gas-solid reactor at least one metallic oxide and other metallic compounds from a relatively higher valence state to an intermediate product of a lower valence state that is mixed with a quantity of exhaust gases,

b. conducting the exhaust gases through a heat exchanger to preheat a second supply of reducing gas,

c. striking an electric arc in an axial gap between generally tubular electrodes spaced along a common axis to provide an arc heated stream,

d. introducing a feed stock carbon-bearing reductant through the axial gap to provide a reducing atmosphere in the arc heated stream,

e. feeding the intermediate product of partially reduced metallic oxide and compounds and preheated second supply of reducing gas into the arc heated stream in an amount in excess of that required to reduce the metallic oxide and compounds from the lower valence state to substantially pure elemental metal, and

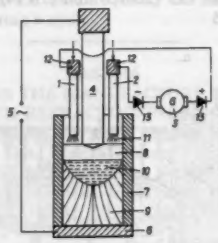
f. recirculating to step (a) the unused excess reducing gas or derivative thereof to assist with the fresh supply of reducing gas in the partial reduction.

4,061,493

METHOD FOR REMOVING UNDESIRED ELEMENTS, PARTICULARLY H_2 AND O_2, IN ELECTROSLAG REMELTING AND AN ARRANGEMENT FOR CARRYING OUT THE METHOD

Heimo Jaeger, Bruck an der Mur, Austria, assignor to Vereinigte Edelstahlwerke Aktiengesellschaft (VEW), Vienna, Austria

Continuation of Ser. No. 580,798, May 27, 1975, abandoned. This application Sept. 24, 1976, Ser. No. 726,190
Claims priority, application Austria, May 28, 1974, 4376/74
Int. Cl.² C22B *4/00; H05B 7/18*
U.S. Cl. 75—10 C **12 Claims**



1. In an electroslag remelting method for removing undesired elements from a metal, including the steps of applying an a.c. voltage between at least one self-consuming electrode and a mold containing a growing ingot, melting said self-consuming electrode in a liquified, conductive slag and solidifying the melt in a liquid-cooled mold, the improvement comprising the steps of:

applying a voltage of a certain first magnitude to one non-fusing auxiliary electrode and a voltage of a magnitude different from said first magnitude to another non-fusing auxiliary electrode which are in electrical contact with said slag for creating a d.c. current flow in the slag; and

removing the undesired elements by fusion electrolysis, said undesired elements which are present in the slag in the form of ions, migrating to said auxiliary electrodes and said self-consuming electrodes, wherein the undesired elements are removed by chemical reaction with the air, the slag and the material of the auxiliary electrodes.

4,061,494

FREE-CUTTING GRAPHITIC STEEL

Takao Yokokawa, Tokyo; Shogo Kanazawa, Kamakura; Yasuo Otoguro; Nobukazu Suzuki, both of Machida; Sigeyuki Akase; Noboru Miida, both of Sagamihara; Tadahisa Akazawa, and Kazuya Kuroiwa, both of Muroran, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 687,583, May 19, 1976, abandoned, which is a continuation of Ser. No. 536,982, Dec. 27, 1974, abandoned. This application July 16, 1976, Ser. No. 705,779

Claims priority, application Japan, Dec. 28, 1973, 48-144720

Int. Cl.[2] C22C *38/02*

U.S. Cl. 75—124 1 Claim

1. A free cutting graphitic steel consisting essentially of

Si: from more than 1.5 to 2.3%

Mn: 0.1 to 0.7%

S: not more than 0.015% one or both Al and Ti in a total amount of: 0.015 to 0.1% rare earth: 0.01 to 0.2% and spheroidized graphite: 0.20 to 0.90% with the balance being iron and unavoidable impurities,

said spheroidized graphite being distributed at a ratio of more than 50 graphites per mm^2.

4,061,495

PLATINUM GROUP METAL-CONTAINING ALLOY

Gordon Leslie Selman, and Richard John Midgley, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed July 7, 1975, Ser. No. 593,250

Claims priority, application United Kingdom, July 8, 1974, 30168/74

Int. Cl.[2] C22C *19/05, 30/00*

U.S. Cl. 75—134 F 8 Claims

1. An alloy consisting essentially apart from impurities of 75.4 wt.% nickel, 17.7 wt.% chromium, 1.06 wt.% aluminium and 5.07 wt.% platinum.

8. An alloy consisting essentially, apart from impurities 10.0 wt.% nickel, 23.5 wt% chromium, 44.7 wt.% cobalt. 7.0 wt.% tungsten, 0.2 wt.% titanium, 0.6 wt.% carbon, 0.5 wt.% zirconium, 10.0 wt.% platinum.

4,061,496

COMBINATION OF TWO TIMING LAYERS FOR PHOTOGRAPHIC PRODUCTS

David Eugene Hannie, Pittsford, and Gerald Louis Ducharme, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 14, 1976, Ser. No. 676,947

Int. Cl.[2] G03C *7/00, 5/54, 1/40, 1/76*

U.S. Cl. 96—29 D 32 Claims

28. In a process of producing a photographic transfer image in color in a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material, a receiving layer, a barrier associated with a neutralizing layer being permeable by said alkaline processing composition after a predetermined time and which is located between said photosensitive silver halide emulsion layer and said neutralizing layer comprising:

a. imagewise exposing said photographic element;

b. treating said element with an alkaline processing composition in the presence of a silver halide developing agent to effect development of each of said exposed silver halide emulsion layers;

i. an imagewise distribution of dye image-providing material being formed as a function of development and

ii. at least a portion of said imagewise distribution of dye image-providing material diffusing to said dye image-receiving layer; and

c. neutralizing said alkaline processing composition by means of said neutralizing layer associated with said photographic element after said predetermined time;

the improvement comprising employing as said barrier two contiguous timing layers, one layer having an activation energy to penetration from aqueous alkaline solution of less than 18 kcal/mole, said one layer comprising a mixture of cellulose acetate and a maleic anhydride copolymer, said mixture comprising about 5 to about 50 percent by weight of said copolymer, and the second layer comprising a polymeric latex having an activation energy to penetration from aqueous alkaline solution of greater than 18 kcal/mole, said polymeric latex comprising a polymer of from about 5 to about 35 percent by weight of polymerized ethylenically unsaturated monomer, from about 2 to about 10 percent by weight of polymerized ethylenically unsaturated carboxylic acid and from about 55 to about 85 percent by weight of polymerized vinylidene chloride.

4,061,497

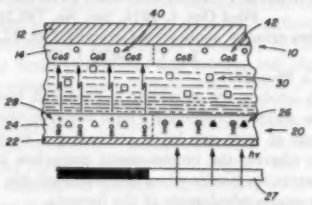
CATALYTIC ACTIVATION OF COBALT COMPLEX IMAGING BY COBALT

Glenn R. Wilkes, Webster, and Albert T. Brault, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 14, 1975, Ser. No. 595,932

Int. Cl.[2] G03C *1/00, 1/40*

U.S. Cl. 96—77 11 Claims



1. An image-recording element comprising

a support, and

at least one image-providing layer on said support,

said layer comprising

a. means for forming CoS in said layer, said means including a source of sulfide ions in an amount of at least about 2.5×10^{-5} moles of sulfide ions dm^2 and a reducible cobalt(III)complex; and

b. a color coupler capable of forming a dye by reaction with an oxidized primary aromatic amine color developing agent.

10. An image-recording element comprising

a support, and

at least one image-providing layer on said support,

said layer comprising

a. means for forming CoS in said layer, said means including a source of sulfide ions, said source being capable of reacting with cobalt(II) and being present in an amount of at least about 2.5×10^{-5} moles of sulfuide ions/dm^2; and

b. a color coupler capable of forming a dye by reaction with an oxidized primary aromatic amine color developing agent, said layer being essentially free of a light-sensitive composition,

and in at least one other layer, a silver halide catalyst capable of photo-initiating a reaction between a reducibel and an oxidizable primary aromatic amine color developing agent.

4,061,498

PHOTOGRAPHIC MATERIAL CONTAINING 2-ACYL-2-PYRAZOLIN-5-ON-COUPLERS

Marcel Jacob Monbaliu, Mortsel; Marc Godfried Mannens, Kessel; Raphaël Karel Van Poucke, Berchem, all of Belgium; Hans-Heinrich Credner, and Ernst Meier, both of Munich, Germany, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed May 27, 1976, Ser. No. 690,583
Claims priority, application Germany, May 30, 1975, 2524134
Int. Cl.[2] G03C *1/40*
U.S. Cl. 96—100 R 2 Claims

1. Light-sensitive material comprising at least one silver halide emulsion layer and a 2-acyl-3-pyrazolin-5-one coupler carrying an alkyl group or aryl group in the 1-position and an alkyl group, aryl group, anilino group or acylamino group in the 3-position.

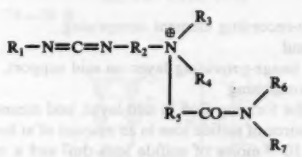
4,061,499

PROCESS FOR HARDENING SILVER HALIDE PHOTOGRAPHIC LAYERS WITH ORGANIC ASYMMETRIC MONOCARBODIIMIDES

Wolfgang Himmelmann, Leverkusen, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 6, 1976, Ser. No. 730,263
Claims priority, application Germany, Oct. 11, 1975, 2545755
Int. Cl.[2] G03C *1/30*
U.S. Cl. 96—111 9 Claims

1. A process for providing a hardened layer in a photographic material containing a light sensitive silver halide emulsion and at least one layer containing a protein containing binder wherein the improvement comprises incorporating a hardener in the binder which is a water-soluble, organic, asymmetric monocarbadiimide of the formula:



wherein

R_1 denotes alkyl with 1–6 carbon atoms, cycloalkyl, aralkyl, alkoxyalkyl or an olefinically unsaturated lower alkyl group,

R_2 denotes alkylene with 2–4 carbon atoms,

R_3 and R_4 denote alkyl with 1–3 carbon atoms or

R_3 and R_4 together denote the atoms required to complete a 5- to 7-membered saturated heterocyclic ring which may contain other hetero atoms in addition to the nitrogen atom,

R_5 denotes alkylene with 1 to 3 C-atoms,

R_6 denotes hydrogen, alkyl with 1 to 4 C-atoms, cycloalkyl, aryl or SO_2-alkyl,

R_7 denotes hydrogen or alkyl with 1 to 9 C-atoms, or

R_6 and R_7 together denote the atoms required to complete a 5- to 7-membered saturated heterocyclic ring which may contain other hetero atoms in addition to the nitrogen atom, and

X^- denotes an anion.

4,061,500

PRESERVATIVE FOR WOOD AND OTHER FIBROUS MATERIALS

Bror Olof Hager, Forsetevagen 5, Djursholm, Sweden

Filed July 7, 1976, Ser. No. 703,287
Claims priority, application Sweden, Mar. 29, 1974, 7404296
Int. Cl.[2] C09D *5/14*
U.S. Cl. 106—15 R 4 Claims

1. An alkaline-reacting preservative composition for protection of wood against blue stain consisting of,

a normal fatty acid having from 6 to 11 carbon atoms;

boric acid; and

at least one alkaline compound selected from the group consisting of sodium hydroxide, sodium carbonate, potassium hydroxide and potassium carbonate,

the amount of said alkaline compound present being in a stoichiometric surplus based on the fatty acids and sufficient to make the preservative composition freely soluble in water.

4,061,501

REFRACTORY LININGS

Paul Lennart Ivarsson, and Peter Harry Havranek, both of Hoganas, Sweden, assignors to Hoganas AB, Hoganas, Sweden

Continuation-in-part of Ser. No. 579,698, May 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 358,304, May 8, 1973, abandoned, and Ser. No. 468,418, May 8, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 620,228
Claims priority, application Sweden, Apr. 13, 1973, 7305330; Finland, May 9, 1972, 1304/72; Sweden, May 11, 1973, 7306722
Int. Cl.[2] C04B *35/04, 35/14, 35/52*
U.S. Cl. 106—44 9 Claims

1. A method for producing a lining material consisting essentially of refractory grains screened below 6 mm and selected from the group consisting of magnesite, dolomite, alumina, bauxite kaolin, silicon carbide, and quartzite, and from 2 to 15 percent by weight of the total solids content of a binder selected from the group consisting of bond clay, aluminate and chromate cements, phosphoric acid, spent sulphite liquor and carboxymethyl cellulose, and containing an additional content of a water suspension colloidal silica in a quantity corresponding to 0.4 – 4% SiO_2 by weight of the solids content of the lining material and further containing carbonaceous material selected from the group consisting of coke, graphite, pitch, and silicon carbide, screened below 1 mm comprising mixing the carbonaceous material and the colloidal silica in the form of a water suspension, and subsequently intermixing the mixture thus obtained with the other ingredients.

4,061,502

BALL CLAY

William Windle, London, England, assignor to English Clays Lovering Pochin & Company Limited, England

Filed Nov. 26, 1975, Ser. No. 635,334
Claims priority, application United Kingdom, Nov. 29, 1974, 51892/74
Int. Cl.[2] C04B *33/13*
U.S. Cl. 106—72 12 Claims

1. A method of improving the properties of a ball clay, which method comprises the steps of:

a. suspending the raw ball clay in water containing a dispersing agent to form a deflocculated suspension the solids content of which is in the range of from 55% to 75% by weight;

b. passing the deflocculated aqueous suspension of raw ball clay through one or more vibrated sieves, at least one of which has a nominal aperture in the range of from 50 to 100 microns; and

c. flocculating the sieved material and subjecting the flocculated material to thermal drying.

4,061,503
SILANE TREATMENT OF TITANIUM DIOXIDE PIGMENT

Sidney Ethan Berger, Rye, N.Y., and George Anthony Salensky, Metuchen, N.J., assignors to Union Carbide Corporation, New York, N.Y.

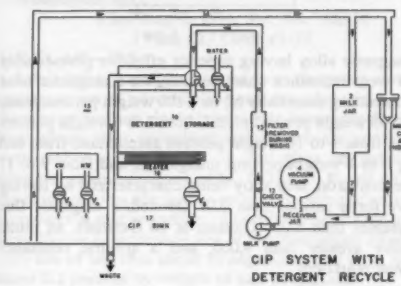
Filed Sept. 29, 1976, Ser. No. 727,673
Int. Cl.[2] C09C *1/36*
U.S. Cl. 106—300 10 Claims

1. A composition comprising titanium dioxide particles containing on their surfaces a silane, its hydrolyzates or resulting condensate, which silane possesses at least two to about three hydrolyzable groups bonded to the silicon thereof and an organic group which contains a polyalkylene oxide group, said silane being present on said surfaces in an amount sufficient to improve the dispersibility of said particles in a resin or plastic medium.

4,061,504
APPARATUS FOR CLEANING AUTOMATIC MILKING MACHINES

Robert R. Zall, Ithaca; A. Theodore Sobel, Brooktondale, and Donald R. Price, Ithaca, all of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed May 21, 1976, Ser. No. 688,569
Int. Cl.[2] A01J *7/00;* B08B *9/10*
U.S. Cl. 134—95 1 Claim



CIP SYSTEM WITH DETERGENT RECYCLE

1. A clean-in-place system for cleaning a component of an automatic milking machine, comprising

a. a container (**17**);

b. means including first valve means (**V3**, **V4**) for supplying to said container a quantity of prerinsing liquid having a temperature of between 50° F and 120° F;

c. an insulated storage receptacle (**16**) for containing a quantity of a cleaning solution;

d. heater means (**18**) arranged in said storage receptacle for maintaining said cleaning solution at a temperature of between 50° F. and 120° F.;

e. means including second valve means (V_3) for supplying the cleaning solution from said storage receptacle to said container;

f. first conduit means (**14**) connected at one end with said container and being adapted for connection at its other end with one end of said milking machine component;

g. two-position diverter valve means (V_1) having an inlet, a first outlet connected solely with said storage receptacle, and a second outlet connected with waste, said diverter valve means being operable between first and second positions to alternately connect the inlet thereof with said first and second outlets, respectively;

h. liquid pump means (**5**) having an inlet adapted for connection with the other end of said milking machine component, and an outlet connected with the inlet of said diverter valve means; and

i. vacuum pump means (**4**) connected with the inlet of said pump means;

j. said vacuum pump means being initially operable—when said first valve means are open, second valve means are closed and said diverter valve is in its second position—for drawing pre-rinsing liquid from said container through said component to the inlet of said pump means, said liquid pump means being operable to discharge the used pre-rinsing liquid to waste, said vacuum pump and liquid pump means then being operable—when said first valve means are closed, said second means is open, and said diverter valve is in its first position—for drawing the cleaning solution from said storage receptacle through the component via said container and for discharging the used cleaning solution into said storage receptacle, said liquid pump means and said vacuum pump means being subsequently operable—when said first valve means is open, said second valve means is closed, and said diverter valve means is in its second position—to refill said container with a quantity of clean rinsing liquid, to draw the rinsing liquid through said component, and to discharge the used rinsing liquid to waste.

4,061,505
RARE-EARTH-METAL-BASED THERMOELECTRIC COMPOSITIONS

Edward F. Hampl, Jr., St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

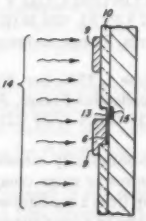
Continuation of Ser. No. 187,861, Oct. 8, 1971, abandoned, and a continuation-in-part of Ser. No. 36,131, May 11, 1970, abandoned. This application Oct. 15, 1973, Ser. No. 406,277
Int. Cl.[2] H01G *1/18*
U.S. Cl. 136—238 5 Claims

1. In a thermoelectric generator, an N-type thermoelectric leg, at least part of the length of which consists essentially of a defect-doped, mixed-valence, N-type thermoelectric composition that exhibits a negative absolute Seebeck coefficient of at least 175 microvolts/°C. and consists essentially of rare-earth metal selected from gadolinium and erbium and chalcogen selected from selenium and tellurium, with from 0 to about 5 atomic-percent of the metal being replaced with cerium, neodymium, praseodymium, yttrium, or a mixed-valence transition element and with from 0 to about 5 atomic percent of the chalcogen being replaced with sulfur or oxygen, and the ratio of chalcogen elements to metal elements being between 1.47 and slightly less than 1.5 to 1; at least about 99 area-percent of said composition being a single phase.

4,061,506
CORRECTING DOPING DEFECTS

David Joal McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 1, 1975, Ser. No. 573,696
Int. Cl.[2] H01L *21/265*
U.S. Cl. 148—1.5 22 Claims



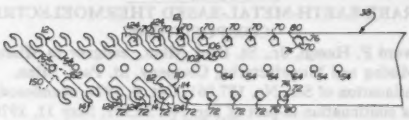
1. In the method of manufacturing semiconductor devices having particular portions determining the operative characteristics thereof, and wherein said method includes the step of precisely locating at least one of said portions with respect to another, the improvement of identifying devices which are latently defective due to excessive misalignment of one or

more pair of interrelated regions by introducing selected impurities to those segments which are excessively misaligned, said selected impurities being of a conductivity type effecting electrical characteristics similar to those predominant ambient surface impurities which with the passage of time tend to render the device inoperative by degrading the operating characteristics of those portions of the device which are misaligned, said selected impurities being introduced in quantities sufficient to complete the said degradation but less than sufficient to degrade the operating characteristics of portions which are not misaligned.

4,061,507
WRENCH AND METHOD OF MAKING THE SAME

Norbert Allmendinger, Willoughby Hills, Ohio, assignor to Richmond Industries, Inc., Willoughby, Ohio

Filed June 28, 1976, Ser. No. 700,190
Int. Cl.² C21D *1/06, 9/00*
U.S. Cl. 148—12 R **5 Claims**



1. A method of sequentially forming a plurality of open-ended wrenches each of which has a pair of spaced apart jaws with accurately formed operating surfaces extending inwardly from outer end portions of the jaws, said method comprising the steps of providing a strip of metal, sequentially forming jaws of a plurality of wrenches to a size and configuration approximating but larger than their final size and configuration by shearing portions of the strip of metal, said step of sequentially forming the jaws of a plurality of wrenches to a size and configuration approximately their final size and configuration including the step of leaving a section of metal extending between outer end portions of the jaws of each of the wrenches, sequentially forming the jaws of the wrenches to their final size and configuration, said step of forming the jaws of the wrenches to their final size and configuration including the step of shearing metal to form the jaw operating surfaces of each of the wrenches while holding the jaws against movement relative to each other with the section of metal extending between the outer end portions of the jaws, and separating from each of the wrenches the section of metal extending between the outer end portions of the jaws.

4,061,508
METHOD FOR CONTINUOUSLY MEASURING THE ANNEALING LEVEL ON WIRES OR STRIPS

Marc Moreau, Asnieres, France, assignor to Trefimetaux, Paris, France

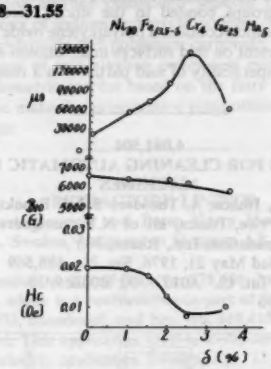
Filed June 1, 1976, Ser. No. 691,608
Claims priority, application France, June 6, 1975, 75.18328
Int. Cl.² G01N *3/00*; B21C *51/00*
U.S. Cl. 148—128 **5 Claims**

1. A method of continuously measuring and adjusting the annealing level on wires or strips comprising the steps of receiving a wire or strip from a continuous annealing installation, passing the wire or strip in a continuous feed over a deforming member at a tension less than that corresponding to the elastic limit of the wire or strip, selecting the configuration of the deforming member and the tension so that passage over the deforming member causes permanent axial elongation of the wire or strip within a predetermined range, and sensing the elongation for controlling the parameters of the annealing operation.

4,061,509
HIGH PERMEABILITY, LONG WEARING MAGNETIC HEAD ALLOY

Nobukazu Kuroda, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 480,116, June 17, 1974, abandoned, and Ser. No. 544,674, Jan. 28, 1975, Pat. No. 3,979,233. This application July 7, 1976, Ser. No. 703,245
Claims priority, application Japan, Feb. 5, 1974, 49-14747
The portion of the term of this patent subsequent to Sept. 7, 1993, has been disclaimed.
Int. Cl.² C04B *35/00*; C22C *19/05*
U.S. Cl. 148—31.55 **1 Claim**

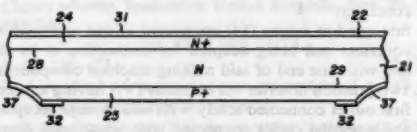


1. A magnetic alloy having superior effective permeability and good wear resistance characteristics for a magnetic head member consisting essentially of, on a 100 weight percent basis, from 79 to 85 weight percent nickel, from 2 to 6 weight percent chromium, from 1 to 10 weight percent germanium, from and including 0 to 4 weight percent manganese, and from 9 to 17 weight percent iron, said alloy being characterized by having a coercive force smaller than 0.07 Oersted, a magnetic flux density greater than 6,000 Gausses at 10 Oersteds, an initial permeability greater than 4,000, and a specific resistance greater than 60μΩ-cm.

4,061,510
PRODUCING GLASS PASSIVATED GOLD DIFFUSED RECTIFIER PELLETS

Richard W. Kennedy, Skaneateles, and Edward G. Tefft, Auburn, both of N.Y., assignors to General Electric Company, Auburn, N.Y.

Continuation-in-part of Ser. No. 405,489, Oct. 11, 1973, Pat. No. 3,941,625. This application Feb. 2, 1976, Ser. No. 654,282
The portion of the term of this patent subsequent to Mar. 2, 1993, has been disclaimed.
Int. Cl.² H01L *21/225*
U.S. Cl. 148—187 **9 Claims**



1. A method of manufacturing semiconductor rectifier pellets comprising the steps of:

providing a semiconductor wafer defining first and second laterally extending major surfaces, said wafer being of a size sufficient to form a plurality of laterally spaced rectifier pellets; wherein the region immediately underlying said first surface is of N-type conductivity and said wafer has a P/N junction therein extending laterally through said pellets;

forming an oxide layer on one of said major surfaces at an elevated oxide-forming temperature;

forming a plurality of laterally spaced openings in said oxide layer with said openings being located respectively in the areas overlying the active device regions of said pellets;

diffusing an auxiliary impurity into said device regions through said openings at an elevated diffusion temperature below said oxide-forming temperature, said auxiliary impurity being one which is selected to decrease carrier lifetime in said pellets;

masking said openings;

forming a second set of openings in said oxide layer, said second set of openings exposing the areas of said wafer between said pellets;

etching grooves in said wafer through said second set of openings, said grooves intersecting said P/N junction and lying between said pellets; and

providing a passivant material in said grooves covering the intersection of said junction with said grooves, said passivant material being provided at a temperature below said diffusion temperature.

4,061,511
ALUMINUM SILICATE STABILIZER IN GAS PRODUCING PROPELLANTS

Robert J. Baczuk, Salt Lake City, Utah, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1976, Ser. No. 710,954
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.9 **1 Claim**

1. In a solid propellant selected from the group consisting of casting power of nitrocellulose and nitroglycerin, high energy fluorine propellant, single base nitrate ester propellant, double base nitrate ester propellant and ammonium perchlorate/Al with rubber binder propellant, that gives off gases selected from the group consisting of N_2, CO_2, CO, F_2 and NO_x during the aging process, the improvement consisting of an additional ingredient in said propellant of an aluminum silicate molecular sieve having a particulate size of less than about 10 microns, a pore size of less than about 10 angstroms, and in an amount of about 0.2 percent by weight of said propellant.

4,061,512
SOLID PROPELLANTS FOR GENERATING HYDROGEN

William M. Chew; Orval E. Ayers; James A. Murfree, and Pasquale Martignoni, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

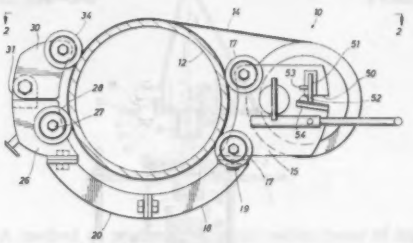
Filed Mar. 22, 1976, Ser. No. 669,064
Int. Cl.² C06B *43/00*
U.S. Cl. 149—22 **3 Claims**

1. A solid propellant composition in the form of a compacted solid propellant pellet that is formed by dead pressing using a pressure from about 500 pounds total load to about 10,000 pounds total load, said solid propellant pellet producing hydrogen or deuterium from a self-sustaining reaction after said reaction is initiated by a heat source sufficient to initiate said reaction, said solid propellant composition comprising a uniform predetermined molar ratio mixture of a first reactant compound which is a complex metal boron compound selected from the complex metal boron compounds of the general formula $M(BH_4)_x$ or $M(BD_4)_x$, (wherein M equals a metal selected from an alkali or an alkaline earth metal and x equals the valence of said metal, H is hydrogen, and D is deuterium) and a second reactant compound which is an ammonium salt selected from the ammonium salts of the general formula $(NH_4)_2Y$ or a deuteroammonium salt selected from the deuteroammonium salts of the general formula $(ND_4)_2Y$, (wherein Y represents the anion Cr_2O_7 with a total charge of 2, N is nitrogen, H is hydrogen, and D is deuterium), said first reactant compound varying in a molar ratio from about 2 to about 7 while said second reactant compound varying in a molar ratio from about 1 to about 2.

4,061,513
WRAPPING APPARATUS FOR PIPELINE JOINTS

Carl G. Danielson, P.O. Box 24248, Houston, Tex. 77029

Filed Dec. 20, 1976, Ser. No. 752,137
Int. Cl.² B65H *81/00, 23/06*
U.S. Cl. 156—392 **10 Claims**



1. An apparatus for placing a cigarette wrap of insulative material around a pipe at a bare place prior to placing the pipe in the ground, comprising:

two sets of first, second and third alignment rollers;

a framework supporting said two sets of first, second and third rollers which positions said two sets of rollers in contact with a pipe to be coated, and wherein the two sets are spaced apart from one another and where said rollers being spaced around the pipe to clamp said framework to the pipe while yet permitting the framework to rotate around the pipe one revolution which rotational movement is supported on said rollers; and

supply means carried by said framework for receiving and dispensing insulative material in sheet form directly onto the pipe with a specified tension and alignment and between said two sets of rollers to place one turn of such material on the pipe and wherein said supply means carries the sheet of material around the pipe to place a cigarette wrap thereon.

4,061,514
PROCESS FOR MASS-PRODUCING WORKS OF ART MADE FROM WOODEN STRIPS

Arthur Strugatz, 256 Asharoken Ave., Northport, N.Y. 11768

Filed Jan. 17, 1977, Ser. No. 760,086
Int. Cl.² B44C *1/28*
U.S. Cl. 156—63 **5 Claims**

1. A process for mass-producing works of art fabricated from strips of material comprises:

a. predetermining the number, size, and shape of the strips required to achieve the desired final design or picture of the work of art;

b. cutting the proper number of lath strips to the sizes necessary for making the final design or picture;

c. painting or staining the cut pieces to the desired color or shade for the final design or picture;

d. dye-stamping the cut pieces to the proper shape for forming the final design or picture;

e. assembling the shaped pieces into the final design or picture; and

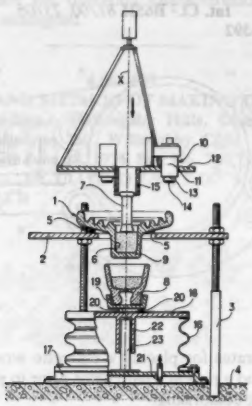
f. fixing the assembled pieces to a suitable backing.

4,061,515

METHOD OF MANUFACTURING SUSPENSION INSULATORS FOR ELECTRIC POWER LINES AND DEVICE FOR THE IMPLEMENTATION THEREOF

Michel Willem, Vichy, France, assignor to Ceraver S.A., Paris, France

Filed Dec. 20, 1976, Ser. No. 752,840
Claims priority, application France, Oct. 12, 1976, 76.30625
Int. Cl.² B32B *31/16*
U.S. Cl. 156—73.6 **8 Claims**



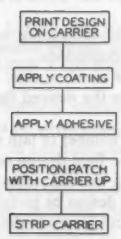
1. In the manufacture of a cap and pin type suspension insulator for an electric power line, a method of cementing said cap and said pin to a dielectric body by vibratory compacting of a sealing composition, the method comprising the steps of: resiliently mounting the body on a supporting table, placing the sealing composition in an internal cavity of the body and in the cap, bringing together the members to be joined with the composition sandwiched between the members, and causing the body to so vibrate by means of vibropercussion that the supporting table remains substantially isolated from vibration while the body executes a vibratory motion including a vertical component superimposed on a tilting component having a rotating axis of tilt such that the body executes a swashplate-like wobble.

4,061,516

PATCHING TECHNIQUE FOR DAMAGED, PRINTED DESIGN

Jay R. George, Manheim; Larry L. Line, and David H. Reed, both of Lancaster, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Oct. 4, 1976, Ser. No. 729,473
Int. Cl.² B32B *35/00*
U.S. Cl. 156—94 **7 Claims**



1. In a process for repairing printed design defects in a decorative surface, the steps comprising:

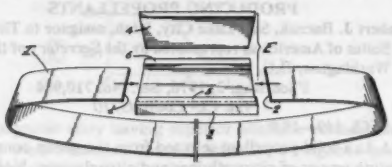
a. printing the decorative surface and printing a compatible design on a carrier with the same printing setup,
b. applying over the design on the carrier a background coating,
c. then applying over said last mentioned coating on the carrier an adhesive layer,
d. said carrier with said printing and coatings forming a repair patch,
e. positioning at least a part of said patch on the design defect in said decorative surface with said adhesive layer adjacent said decorative surface, and
f. stripping said carrier from said patch.

4,061,517

METHOD OF MAKING FLUOROCARBON RESIN COVERED GASKETS

Frederick O. Dutton, III, Moorestown, and Joseph H. Stewart, Jr., Cherry Hill, both of N.J., assignors to Chemelec Products, Inc., Cherry Hill, N.J.

Continuation-in-part of Ser. No. 608,065, Aug. 27, 1975, abandoned. This application May 17, 1976, Ser. No. 687,013
Int. Cl.² B29C *17/04*
U.S. Cl. 156—212 **7 Claims**



1. The method of making annular gaskets having outer covers of fluorocarbon resin which comprises:

forming a flat strip of a fluorocarbon resin tape of predetermined length and uniform width and thickness throughout the length thereof,

disposing the opposite ends of said flat strip in abutting relation and confining the abutting opposite end portions of the strip at the opposite sides and surfaces thereof according to the uniform width and thickness dimensions of the tape.

subjecting the end portions of the strip while thus confined to a temperature and pressure operable to weld the confined abutting end portions of the tape and form a continuous circle of flat tape having uniform width and thickness throughout the length thereof,

pressing and circumferentially elongating the opposite side and edge portions of the continuous circle of tape to increase the circumferential dimension of said tape in the opposite edge portions thereof substantially to the outer circumference of a selected annular inner gasket,

and doubling the circumferentially elongated tape about the inner edge of said selected annular inner gasket to provide a cover therefor with the opposite side and edge portions of said tape disposed in overlying relation upon the opposite faces of the inner gasket.

4,061,518

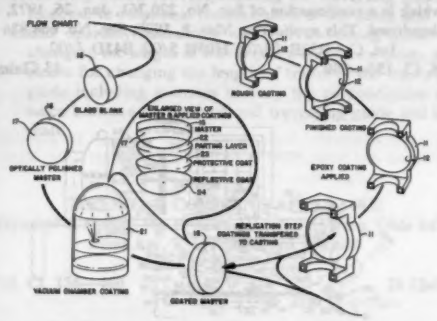
METHOD FOR MAKING AN ARTICLE HAVING REPLICATED COATING WITH DURABLE DIELECTRIC OVERCOAT

Viola F. Burroughs; Hasso G. Vahl, both of Los Angeles, and Harro W. D. Wahl, Whittier, all of Calif., assignors to Harold C. Hohbach, Atherton, Calif.

Continuation of Ser. No. 484,409, July 1, 1974, abandoned. This application June 10, 1976, Ser. No. 694,651
Int. Cl.² B32B *33/00, 27/38, 31/26*
U.S. Cl. 156—232 **6 Claims**

1. In a method for forming replicated optical parts, produc-

ing a master having a surface to be replicated formed thereon, depositing in a vacuum a parting agent in the form of a silicon oil on to the surface to form a thin parting layer of the silicon oil, forming a protective coating on the parting layer in a vacuum at a relatively low temperature ranging from approximately 40° to 100° C but at a sufficiently high temperature to



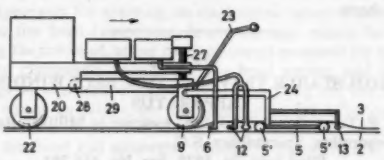
cause an initial partial curing of the protective coat, forming an optical coating on the protective coat at a relatively low temperature ranging from approximately 40° to 100° C, and post-curing the part with the coats thereon in air at an elevated temperature in excess of approximately 200° C for a minimum period of time in excess of approximately 4 hours to cause final curing and hardening of the protective coat.

4,061,519

PROCESS FOR THE CONTINUOUS OVERLAP WELDING OF PLASTIC SHEETS OR PANELS

Heiner I. Hummer, Rosengarten, Germany, assignor to Schlegel Engineering GmbH, Hamburg, Germany

Continuation of Ser. No. 581,244, May 27, 1975, abandoned. This application Jan. 28, 1977, Ser. No. 763,505
Claims priority, application Germany, May 29, 1974, 2426154
Int. Cl.² B32B *31/00*
U.S. Cl. 156—244 **8 Claims**



1. In a process for the continuous overlap welding of thermoplastic sheets or panels on the ground by heating and compressing the facing overlapped sheets, comprising the steps of placing the sheets or panels to be welded on the ground in side by side position, overlapping the edges of adjacent sheets or panels and maintaining one edge on the ground, lifting the overlapped edge of the upper sheet or panel and placing a preheating means between the sheets or panels in the region of said overlapped edges, controlling the location of the preheating means between the said overlapped edges in accordance with the unevenness of the ground in the area of preheating and preheating the said overlapped edges to the softening point thereof, extruding additional material between the preheated overlapped edges while the edges are apart, heating the additional material into the thermoplastic state at least high enough to maintain a sufficient level of heat in said overlapped edges to permit the bonding of said edges to said additional material, and controlling the placement of said additional material such that said additional material contacts both edges substantially simultaneously, and applying pressure to press the overlapped edges against the ground to weld said sheets or panels to said additional material and thereby to each other.

4,061,520

METHOD OF MAKING COMPOSITE HIGH STRENGTH TO WEIGHT STRUCTURE

Andrew M. Cecka, Covina, and Pol Dano, Camarillo, both of Calif., assignors to Fansteel Inc., North Chicago, Ill.

Division of Ser. No. 633,300, Nov. 17, 1975, abandoned, which is a continuation of Ser. No. 442,204, Feb. 13, 1974, abandoned. This application Sept. 3, 1976, Ser. No. 720,514
Int. Cl.² B29G *7/00*
U.S. Cl. 156—245 **4 Claims**

1. A method of producing a tennis racket frame of high strength to weight ratio comprising providing a mold cavity shaped in the form of a tennis racket frame having oppositely disposed faces and having a handle with a grip at one end and a head of ellipsoid shape attached to the other end, the handle grip of said mold cavity having two substantially parallel cavity portions corresponding to two sides of said handle, forming an elongated core of uniform cross section from a foamable resin composition having the consistency of a firm putty, having an expansion ratio from about 1.5 to about 5.0 and comprising an uncured resin, a curing agent and a blowing agent, wrapping said core with a plurality of layers of unidirectionally oriented resin coated graphite fibers, each of said layers having its fibers oriented at an angle to the direction of said core, at least one of said layers having its fibers oriented in a direction different from the direction of orientation of the fibers in at least one other of said layers, arranging said wrapped core within said mold cavity with both ends of said wrapped core at the grip end of said mold, said wrapped core extending from one of its ends at the grip end of said mold cavity, up one of said substantially parallel cavity portions in the handle portion of said mold cavity, around a major portion of the head portion of said mold cavity and down the other substantially parallel cavity portion in the handle portion of said mold cavity to terminate at the grip end of said mold cavity, arranging an additional layer of graphite fibers on each of said oppositely disposed faces of said frame along the direction of said core, therafter sealing said mold cavity, heating said foamable resin composition to cause expansion thereof and generate pressure within said mold cavity pressing said core against said layers of graphite fibers, and thereafter removing said expanded wrapped core as an integral composite tennis racket frame, said mold cavity being of smaller cross-sectional area than the cross-sectional area of said core would be if said core were permitted free expansion.

4,061,521

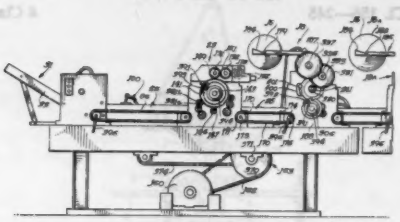
METHOD AND APPARATUS FOR MANUFACTURE OF SWATCH BEARING SHEETS

Stanley Lerner, Highland Park, and Robert Shearer, Park Ridge, both of Ill., assignors to Color Communications, Inc., Melrose Park, Ill.

Filed July 19, 1976, Ser. No. 706,433
Int. Cl.² B32B *31/00*
U.S. Cl. 156—265 **18 Claims**

1. A method of manufacture of swatch bearing sheets each bearing rows of swatches adhered to the sheet at predetermined locations thereon, said method comprising the steps of:

feeding a succession of sheets along a predetermined straight path at timed intervals, feeding a first set of webs of swatch material to a first swatch forming and applying station, simultaneously severing individual swatches from the webs to form a first set of swatches, transferring simultaneously the first set of swatches to the sheet by rolling contact a set of swatches from an in-line intersecting path to said straight path, and adhering a plurality of swatches formed from said first set of webs to each sheet traveling through the first swatch forming and applying station at first predetermined locations on each sheet, feeding each of the sheets from said first station along said



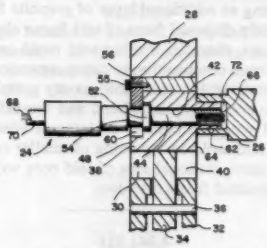
straight path to a second swatch forming and applying station located downstream of said first station and in-line with said first station, simultaneously severing a second set of swatch material webs at said second station to form a second set of swatches, and tranferring simultaneously the second set of swatches to the sheet by rolling contact the second set of swatches from an in-line an intersecting path with said straigth path, and adhering by rolling contact a second set of swatches severed from the second sheet of webs of swatch material to each sheet passing along said path and through said second station to provide the sheet with plural rows of swatches attached thereto at predetermined locations on the sheet.

4,061,522

METHOD AND APPARATUS FOR TERMINATING A FIBER OPTIC BUNDLE

Michael I. Bauerkemper, Cerritos, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 3, 1977, Ser. No. 765,073
Int. Cl.² C09F *5/00*
U.S. Cl. 156—305 **12 Claims**



1. A method of mounting a contact having a bore therethrough, a front mating end and a rear end on a fiber optic bundle comprising the steps of:

inserting the bundle without an adhesive into said bore from the rear of said contact until the front face of said bundle is substantially flush with said front mating end;

thereafter injecting an adhesive into said bundle through the opening of said bore at said front mating end; and

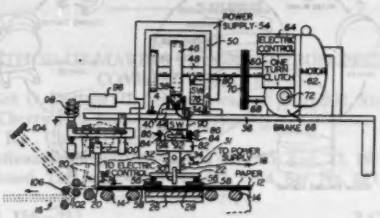
allowing said adhesive to cure.

4,061,523

PAPER WELDING APPARATUS FOR BOOKBINDING MACHINERY

Bernard T. Sendor, 608 Blair Drive, Westbury, Long Island, N.Y. 11429, and Mortimer S. Sendor, 80-30, 221st St., Queens Village, Long Island, N.Y. 11590

Division of Ser. No. 480,244, June 17, 1974, Pat. No. 3,943,024, which is a continuation of Ser. No. 220,761, Jan. 26, 1972, abandoned. This application Mar. 8, 1976, Ser. No. 664,826
Int. Cl.² B32B *19/02*; H05B *5/00*; B42D *1/00*
U.S. Cl. 156—380 **13 Claims**



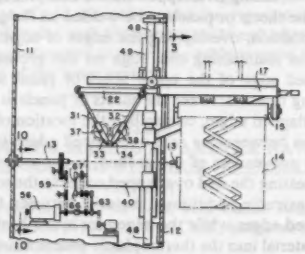
1. Apparatus for binding books by welding paper sheets together including in combination clamping jaws for applying a stationary pressure to a group of paper sheets in contact with each other along regions that constitute edges of pages printed on said sheets, means for heating the paper along said regions including a radio-frequency generator, connections through which radio-frequency power from the generator can generate paper-welding heat in the clamped edges of the sheets, means for changing the heat for welding in accordance with the thickness of the group of sheets, with which the apparatus is used, to raise the clamped edges to a welding temperature of the paper and a limited temperature that avoids overheating and scorching of the paper sheets, and means for urging the clamped jaws together, the means urging the clamping jaws together having their force coordinated with the power supply from the radio-frequency generator to the paper so that the pressure between adjacent sheets of paper is high enough to prevent flashover of the radio-frequency power between adjacent sheets.

4,061,524

ADJUSTABLE TRAVERSE TIRE BELT WINDING APPARATUS

John R. Tolan, South Bend, Ind., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Sept. 24, 1975, Ser. No. 616,381
Int. Cl.² B29H *17/28*
U.S. Cl. 156—397 **7 Claims**



1. Apparatus for forming a tire reinforcing belt by positioning a continuous cord on a rotatable support surface in a zigzag pattern comprising:

a frame;

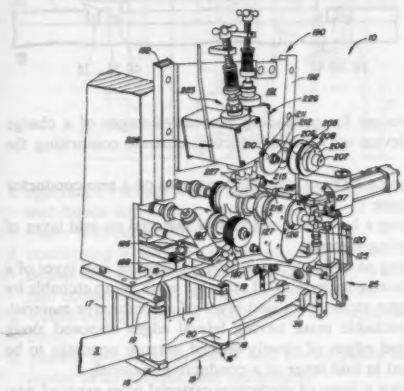
a support surface rotatably mounted on said frame;
means to rotate said support surface;
a traversing guide reciprocably mounted on said frame;
means for supplying cord to said support surface over said traversing guide;
a shaft mounted on said frame and adapted for rotational reciprocation about its longitudinal axis;
connecting means for reciprocating the traversing guide in response to rotational reciprocation of the shaft; and
means operably associated with the traversing guide for changing the length of travel of the traversing guide, said means for changing the length of travel of the traversing guide including a means to vary the perpendicular distance between the path of said traversing guide and said shaft.

4,061,525

TIRE BEAD COVERING APPARATUS

Raymond J. Slezak, 558 Princeton Ave., Barberton, Ohio 44203

Filed Apr. 7, 1976, Ser. No. 674,689
Int. Cl.² B29H *17/22*
U.S. Cl. 156—460 **21 Claims**



1. Apparatus for applying an elastomeric cover stock to an annular tire bead comprising, lower carriage means for supporting the tire bead, upper carriage means mounted for movement to clampingly engage the tire bead against said lower carriage means, means for rotationally driving the tire bead, roller means on said upper carriage means for adhering the cover stock to the tire bead adjustably positioned with respect to the tire bead and adjustably resiliently biased thereat, fold roller means having two opposed rollers angularly offset with respect to the tire bead passing therebetween for adhering the cover stock to the lateral extremities of the tire bead, and stock feed and severing means supplying a length of the cover stock sufficient for wrapping about the circumference of the tire bead.

4,061,526

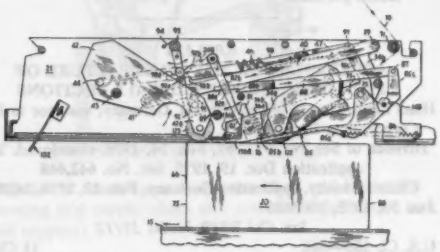
CARTON SEALING MACHINE HAVING RELEASABLE LATCHING MEANS TO HOLD RETRACTED TAPE APPLYING MEANS WHILE ANY CARTON TRAVELS THEREPAST

Saul Warshaw, Hawley, Pa.; Winton Loveland, Fort Salonga, N.Y.; Horst J. Hanemann, Manhasset, N.Y., and Michael Ramaglia, East Patchogue, N.Y., assignors to The Loveshaw Corporation, Deer Park, N.Y.

Filed July 13, 1976, Ser. No. 704,767
Int. Cl.² B32B *31/00*
U.S. Cl. 156—468 **11 Claims**

1. In a machine for sealing forwardly traveling rectangular cartons with adhering tape extending longitudinally from end to end and lapping folded stacked flaps as top and/or bottom closure means to prevent normally projecting tape applicator means from applying to such closure means of each carton excessive inward pressure which may cause such deflection thereof as to catch into and break back out an edge portion of the carton trailing back end wall; comprising

1. movably mounted tape applicator means projectable into a defined path of forward travel of a closure of folded and stacked flaps of an advancing carton and biased inward thereagainst normally for depression thereby as the carton travels forward for application of tape to such forwardly traveling closure;



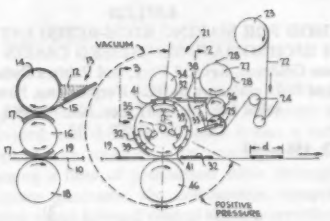
2. mechanism alternately to project and retract said tape applicator means located initially in the path of forward travel of each such carton for retractive manipulation of said inwardly biased projecting applicator means upon contact by said advancing carton;
3. releasable latch means manipulated by said mechanism to hold said tape applicator means retracted to the vicinity of the margins of the forward travel path of such carton and its closures of folded flaps while said advancing carton and its closure are traveling past said tape applicator means; and
4. means to release said latch means for restoring the projection of said tape applicator means into the carton travel path after passage of said carton.

4,061,527

APPARATUS FOR APPLYING PATCHES TO A CONTINUOUS WEB

John E. Traise, Niagara Falls, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Apr. 12, 1977, Ser. No. 786,775
Int. Cl.² B32B *31/00*; B31B *1/00*
U.S. Cl. 156—519 **6 Claims**



1. Apparatus for the application of patches to a moving continuous web, comprises:

means for applying adhesive to selected portions of the moving continuous web at predetermined distances apart;
means for perforating a web of patch material along transverse lines spaced predetermined distances apart, said perforating means including a pair of first rolls rotatable at

a first rate of speed, one of said first rolls having cutting blades thereon;

means for bursting said web of patch material into individual patches along said spaced lines, said bursting means including a pair of second rolls rotatable at a second rate of speed higher than said first rate of speed; and

means for transferring said patches on to said moving continuous web so as to overlie said selected portions thereof, said transferring means including one of said second rolls provided with means for retaining said patches on the circumferential surface of said one second roll and depositing each of said retained patches on to said moving continuous web in overlying relationship with said selected portions.

4,061,528

APPARATUS FOR THE MANUFACTURE OF PREFABRICATED LINED WALL SECTIONS

Hans Lingl, Neu-Ulm-Ludwigsfeld, Germany, assignor to Lingl Corporation, Paris, Tenn.

Division of Ser. No. 552,261, Feb. 24, 1975, abandoned. This application Dec. 19, 1975, Ser. No. 642,448

Claims priority, application Germany, Feb. 22, 1974, 2408484; Jan. 30, 1975, 2503685

Int. Cl.² B32B *31/20, 31/12*

U.S. Cl. 156—561 **11 Claims**

1. Apparatus for producing a preformed finished wall section comprising:

a. means for disposing a preformed wall panel of bricks, blocks, or the like in a generally horizontal plane, said panel being adapted to be disposed vertically when a finished wall section of which the panel is a part is in use,

b. means for arranging in a generally horizontal plane a plurality of individual tile members or the like in substantially abutting engagement with each other to form an unconnected lining panel,

c. means for applying a plurality of columns of mortar or the like on the upper surface of said wall panel,

d. means for automatically introducing spaces of predetermined uniform dimension between said tile members by moving said tile members out of substantially abutting engagement with each other, for proper disposition thereof in relationship with said wall panel,

e. means for transferring said unconnected lining panel members in groups into operative position above said wall panel, and

f. means for pressing said lining panel tile members in groups onto said wall panel, said individual members being connected to each other and said wall panel by said columns of mortar or the like thereby forming a preformed finished wall section.

4,061,529

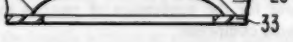
METHOD FOR MAKING ETCH-RESISTANT STENCIL WITH DICHROMATE-SENSITIZED CASEIN COATING

Abraham Goldman, Kendall Park, and Pabitra Datta, Cranbury, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,996

Int. Cl.² C23F *1/02*

U.S. Cl. 156—644 **10 Claims**



1. A method for producing an etch-resistant stencil upon a surface comprising applying to said surface a coating of a liquid composition comprising

i. acid precipitated casein, as the sole sensitizable protein material in said liquid composition,

ii. alkali dichromate photosensitizer for said casein,

iii. sodium borate, as the sole alkalizing agent in said liquid composition,

iv. and water, drying said coating, photoexposing said dry coating to a light image, developing said exposed coating to produce said stencil, and then baking said stencil in air to render said stencil etch resistant.

4,061,530

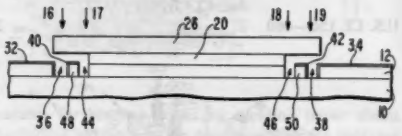
PROCESS FOR PRODUCING SUCCESSIVE STAGES OF A CHARGE COUPLED DEVICE

Harold H. Hosack, Cupertino, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed July 19, 1976, Ser. No. 706,867

Int. Cl.² H01L *21/306*

U.S. Cl. 156—653 **2 Claims**



1. A process for producing successive stages of a charge coupled device on a semiconductor substrate comprising the steps of:

a. forming a layer of insulating material on a semiconductor substrate;

b. forming a layer of a conductive material on said layer of insulating material;

c. forming an etchable mask over portions of said layer of a conductive material, said etchable mask being etchable by different etches than said layer of a conductive material, said etchable mask having lateral edges disposed along selected edges of closely spaced narrow openings to be formed in said layer of a conductive material;

d. forming a layer of protective material over exposed portions of said layer of a conductive material, said layer of protective material having lateral edges which overly in one-to-one relation the lateral edges of said etchable mask;

e. etching said lateral edges of said etchable mask to expose unprotected portions of said layer of conductive material;

f. etching the exposed portions of said layer of a conductive material down to the surface of said layer of insulating material;

g. etching the exposed edges of said etchable mask a second time to expose additional unprotected portions of said layer of conductive material;

h. forming another layer of protective material over the exposed portions of said layer of conductive material;

i. etching the exposed edges of said etchable mask a third time to expose further unprotected portions of said layer of conductive material; and

j. etching the then exposed portions of said layer of conductive material down to the surface of said layer of insulating material, thereby producing narrow segments of said conductive material on said layer of insulating material.

4,061,531

COKE OVEN GAS CONTACT WITH LIQUOR CONCENTRATE

Richard Jablin, P.O. Box 514, Winchester, Va. 22601

Filed Dec. 12, 1975, Ser. No. 640,331

Int. Cl.² B01D *1/00, 1/16*

U.S. Cl. 159—48 L **7 Claims**

1. A process of separating coke oven gas derived from the

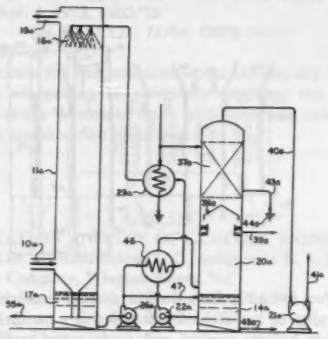
destructive distillation of coal in a coke oven into its components without addition of external heat comprising:

a. feeding said gas directly from the coke oven to a primary cooler,

b. directly contacting said gas in said cooler with a liquor, derived from step (j) hereinbelow, to cool said gas, to transfer components from said gas to the liquor, and to heat said liquor,

c. withdrawing cooled gas containing remaining components as the overhead from said primary cooler,

d. passing at least a portion of said heated liquor from said cooler directly to an evaporator without addition of further heat to said heated liquor,



e. applying a vacuum to said liquor in said evaporator to boil said liquor and form a cooled concentrated brine and a vapor without addition of heat,

f. condensing a portion of said vapor in an indirect condenser to form a condensate and separately withdrawing said condensate and said uncondensed vapors,

g. withdrawing a portion of said brine as concentrated produce,

h. passing at least a portion of said heated liquor from said cooler to an indirect heat exchanger,

i. removing heat from said heated liquor in said heat exchanger to cool said liquor passed thereto, and

j. feeding said cooled liquor from step (i) to said primary cooler for use in step (b).

4,061,532

ADJUSTABLE SUCTION DEVICE FOR A PAPER MACHINE

Mario Biondetti, Schio, Italy, assignor to Escher Wyss GmbH, Weingarten, Germany

Filed Aug. 30, 1976, Ser. No. 718,514

Claims priority, application Switzerland, Sept. 2, 1975, 11360/75

Int. Cl.² D21F *1/54*

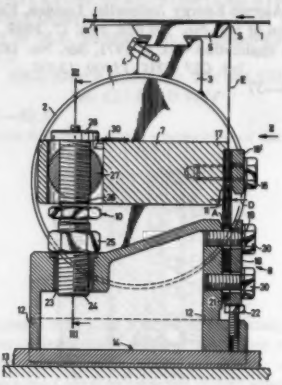
U.S. Cl. 162—352 **11 Claims**

1. A suction device for a paper machine comprising

a suction strip having a suction surface for cooperating with a wire of the paper machine and a front tip;

a carrier having said suction strip rigidly fixed thereon, said carrier being disposed transversely of the wire of the paper machine;

a pair of supports pivotally supporting said carrier about a common pivot axis extending longitudinally of said carrier and located in a plane extending through said front tip of said suction strip perpendicularly of the wire, each support being disposed at a respective end of said carrier and including a housing for mounting on the paper machine, a leaf spring rigidly fixed to said housing and vertically disposed in said plane, and a plate mounted on said carrier and secured to said leaf spring; and



an adjustment means on at least one end of said carrier for pivoting said carrier about said common axis relative to said supports.

4,061,533

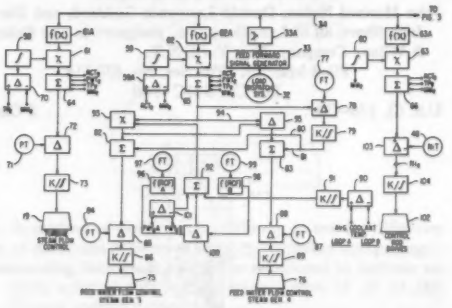
CONTROL SYSTEM FOR A NUCLEAR POWER PRODUCING UNIT

Oliver W. Durrant, Bath Township, Summit County, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Sept. 25, 1975, Ser. No. 616,693

Int. Cl.² G21C *7/00*

U.S. Cl. 176—20 R **15 Claims**



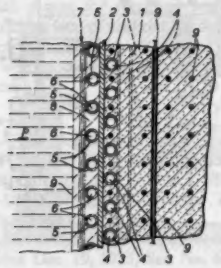
1. In a control system for a nuclear power producing unit comprising a pressurized water reactor, a once-through steam generator provided with feedwater supply means, a turbine-generator supplied with steam from the steam generator and means maintaining a flow of pressurized water through the reactor and steam generator, the combination comprising; means generating a feed forward control signal proportional to the desired power output of the power producing unit, a second means for adjusting the reactor heat release, a third means for adjusting the rate of flow of feedwater to the steam generator, said second and third means solely responsive to and operated in parallel from said feed forward control signal whereby the reactor heat release and the rate of flow of feedwater to the steam generator are each maintained in a discrete functional relationship to said feed forward control signal.

4,061,534

NUCLEAR REACTORS

George Oliver Jackson, Timperley, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 799,834, Feb. 17, 1969, abandoned. This application Oct. 6, 1971, Ser. No. 187,183
Int. Cl.[2] G21C *13/00, 15/00*
U.S. Cl. 176—37 7 Claims



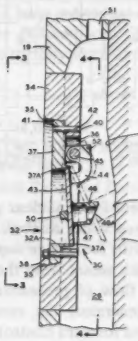
1. A nuclear reactor comprising a concrete shielding vessel with a steel lining, containing a freezable liquid metal coolant comprising the element sodium, a solid nuclear reactor core, a primary heat exchanger and a pump means all submerged in the coolant, the pump means being provided for circulating the coolant liquid within the vessel, cooling pipes within the vessel adjacent the inner surface of said vessel for effecting the freezing of the liquid coolant at the inner surface of the vessel, said cooling pipes containing a liquid metal cooling fluid, an interior wall adjacent the said inner surface, said interior wall comprising a frozen layer of the liquid coolant on and supported by the cooling pipes and the inner surface of the vessel, the said frozen layer interior wall being thin relative to the overall cross-section of the vessel.

4,061,535

INDUSTRIAL TECHNIQUE

John Howard Nolan; Donald Lawrence Goddard, and Barrett John Short, all of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Mar. 25, 1976, Ser. No. 670,314
Int. Cl.[2] G21C *9/00*
U.S. Cl. 176—38 6 Claims



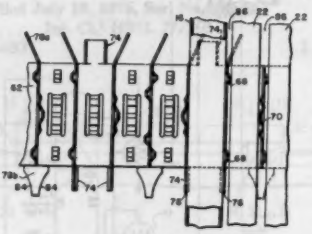
1. An energy absorbing pressure relief valve for a core support cylinder of a nuclear reactor comprising a valve body for fluid flow therethrough having portions defining a fluid passageway, hinge means attached to the body, a plate suspended from the hinge means in sealing engagement with the passageway, an energy absorbing deformable member mounted on the plate and extending outwardly therefrom, the deformable member including a partially annular column open at its outwardly extending end and orifice means through the walls of said annular column.

4,061,536

FUEL ASSEMBLY FOR NUCLEAR REACTORS

Robert J. Creagan, Pitcairn, and Erling Frisch, Pittsburgh, both of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation of Ser. No. 721,122, April 12, 1968, abandoned, which is a continuation of Ser. No. 552,976, May 25, 1966, abandoned. This application Nov. 6, 1972, Ser. No. 304,292
Int. Cl.[2] G21C *3/34*
U.S. Cl. 176—78 2 Claims



1. A fuel assembly for a nuclear reactor comprising:
a plurality of fuel elements disposed in a parallel array;
multiple hollow control rod guide tubes positioned in a predetermined pattern among said fuel elements;
a plurality of grids of egg-crate configuration having openings therein through which said fuel elements and guide tubes extend for imparting lateral support thereto;
said plurality of grids including top and bottom grids respectively located adjacent the top and bottom of said assembly, and at least one grid intermediate said top and bottom grids;
said grids except said top and bottom grids including coolant mixing vanes thereon which impart a mixing action to coolant adapted to flow upwardly through the assembly;
means securing each of said guide tubes to said grids;
flow apertured plate means adjacent opposite ends of said fuel elements and guide tubes, said plate means at one end supporting said fuel elements and guide tubes and at the other end supporting said guide tubes;
a common header holding multiple control rods designed for telescopic and longitudinal movement in the corresponding guide tubes.

4,061,537

POLYIONIC ISOTONIC SALT SOLUTION

Fritz Seiler, Marburg an der Lahn, and Andreas Michael Schwarzbeck, Mannheim, both of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany

Filed July 16, 1976, Ser. No. 705,816
Claims priority, application Germany, July 18, 1975, 2532183
Int. Cl.[2] C12B *3/00;* C12K *1/10*
U.S. Cl. 195—1.7 2 Claims

1. In a polyionic aqueous salt solution adaptable to the preservation of erythrocytes and of organs for transplantation and to maintaining the viability of microorganisms, said solution comprising physiologically tolerable cations and anions, the improvement wherein said solution comprises potassium ions at a concentration equal to or greater than 80 mval per liter, comprises magnesium ions at a concentration equal to or greater than 1.7 mval per liter, and which comprises, as anions, a total concentration between 90 mval per liter and 160 mval per liter of chloride, sulfate, phosphate, and anions of an or-

ganic aliphatic fatty acid or of an aliphatic hydroxy acid, the concentration of chloride anions being at most 100 mval per liter.

4,061,538

ENZYMATICALLY OXIDIZING INTERFERON

Friedrich Dorner, Vienna; Marianne Scriba, Maria Enzerdorf, and Rudolf Weil, Vienna, all of Austria, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 456,702, April 1, 1974, abandoned. This application Feb. 6, 1975, Ser. No. 547,782
Claims priority, application Switzerland, Apr. 4, 1973, 4801/73; Apr. 4, 1973, 4802/73
Int. Cl.² C12D *13/06*; C07B *29/02*
U.S. Cl. 195—29 3 Claims

1. A process for the production of a structurally modified interferon, comprising enzymatically oxidising the terminal galactose unit in asialointerferon with galactose oxidase and recovering the modified interferon.

4,061,539

PREPARATION AND USE OF GLUCOSE ISOMERASE

Chin Kee Lee, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Oct. 20, 1976, Ser. No. 734,222
Int. Cl.² C12D *13/10*
U.S. Cl. 195—31 F 7 Claims

1. A process for preparing a glucose-isomerizing enzyme which comprises cultivating a microorganism belonging to the species *Flavobacterium arborescens* in a nutrient medium under conditions suitable for production of said enzyme by said microorganism and recovering said enzyme.

4,061,540

CHOLESTEROL OXIDAZE AND PROCESS FOR PREPARING SAME

Fumihiko Yoshida, Matsudo; Kiyoshi Mizusawa, and Kazuo Nakamura, both of Noda, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Japan

Filed June 29, 1976, Ser. No. 700,859
Claims priority, application Japan, July 4, 1975, 50-81935
Int. Cl.² C12D *13/10*
U.S. Cl. 195—62 10 Claims

1. Cholesterol oxidase which is produced by a microorganism belonging to the species *Corynebacterium cholesterolicum*, has a molecular weight of 57,000 as measured by Weber's SDS disk electrophoresis, and oxidizes the hydroxyl group attached to the 3β-position of steroids and exerts no action upon the hydroxyl groups attached to other positions nor upon esters.

4,061,541

PREPARATION OF ALKALINE ALPHA-AMYLASE

Ernest Wendell Boyer, and Morton Blakeman Ingle, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 12, 1971, Ser. No. 123,880
Int. Cl.² C07G *7/028*
U.S. Cl. 195—66 R 1 Claim

1. A process for the production of an alpha-amylase having maximum activity at a pH value from 9 to 9.2 and at about 50° C. comprising growing under aerobic conditions and at a pH from about 8 to about 10 a culture of *Bacillus* species NRRL B-3881 in a medium containing appropriate nutrients and then recovering the enzyme therefrom.

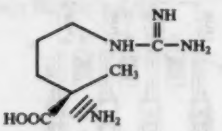
4,061,542

2-METHYL-L-ARGININE PRODUCED BY CULTIVATING STREPTOMYCES STRAIN

Thomas Casimir Demny, Livingston, and Hubert Maehr, Belleville, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 8, 1976, Ser. No. 664,834
Int. Cl.² C12D *9/14*
U.S. Cl. 195—80 R 2 Claims

1. A process for producing a compound of the formula:



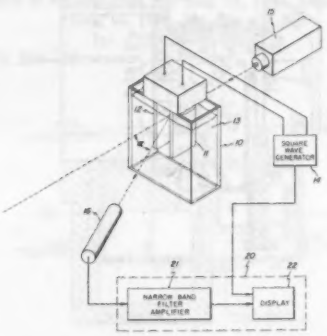
which comprises cultivating a strain of Streptomyces X-11837 in an aqueous carbohydrate solution containing a nitrogenous nutrient under submerged aerobic conditions until activity versus Escherichia Coli B is imparted to said solution and then recovering said compound from said solution.

4,061,543

BIOASSAY FOR DRUGS AND ANTIBIOTICS

Charles P. Bean, Schenectady, N.Y.; Roy J. King, Jr., San Mateo, Calif., and Egidijus E. Uzgiris, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,606
Int. Cl.² C12K *1/00*
U.S. Cl. 195—103.5 K 6 Claims



1. A method of performing a bioassay to test for effectiveness of medicinal substances upon cell mobility comprising:

suspending biological cells to be monitored in isotonic sucrose solution substantially in the range of .02 to .001 Normal sodium chloride;

establishing an electric field across at least a portion of said solution;

introducing into said solution over a finite period of time a medicinal substance to be examined for efficacy;

irradiating said solution within said electric field with a beam of coherent light;

detecting light scattered by at least some of said cells suspended in said solution;

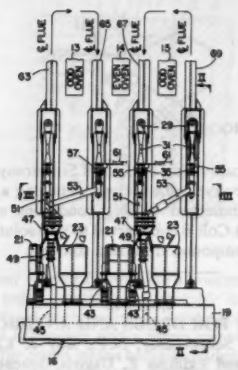
varying amplitude of said electric field as said medicinal substance to be evaluated encounters said cells suspended in said solution so as to maintain at maximum a signal corresponding to a predetermined frequency difference between the incident beam of coherent light and said light scattered by at least some of said cells suspended in said solution; and

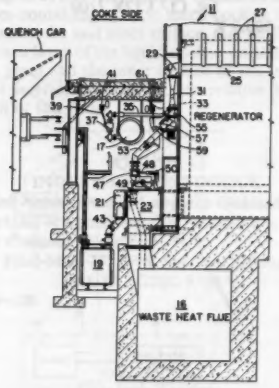
measuring the resulting changes in electric field amplitude required to maintain said signal at maximum.

4,061,544
APPARATUS FOR PROVIDING WASTE GAS RECIRCULATION IN COKE OVEN BATTERIES

Joseph van Ackeren, Allison Park, and Edward J. Helm, Pittsburgh, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed May 3, 1976, Ser. No. 682,562
Int. Cl.[2] C10B 5/02, 5/12, 43/12
U.S. Cl. 202—141 4 Claims





1. In a gun flue type coke oven battery having a plurality of heating chambers, heating walls having flues therein, a plurality of internal fuel conduit means adapted to carry a gaseous fuel into the flues of each heating wall for burning therein and means for conducting the waste gases of combustion to a regenerator for regenerating said gases by reclaiming heat therefrom, the improvement comprising:

a. a plurality of first conduit means carrying fuel gas into a preselected internal conduit means for the flues for said heating walls, said first conduit means being disposed outside of said battery, said first conduit means including control means for selectively diverting the fuel gas to a selected first conduit means,

b. a plurality of second conduit means adapted to carry said regenerated waste gas into said first conduit means, said second conduit means being disposed outside of said battery,

c. a third conduit means communicating with a reservoir means disposed outside said battery for receiving said regenerated gas from said regenerating means and with said second conduit means, said third conduit means including control means for selectively diverting the flow of regenerated gas to a preselected second conduit means; and

d. means for aspirating said regenerated gas with said fuel gas.

4,061,545
POLYMERIZATION INHIBITOR FOR VINYL AROMATIC COMPOUNDS

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

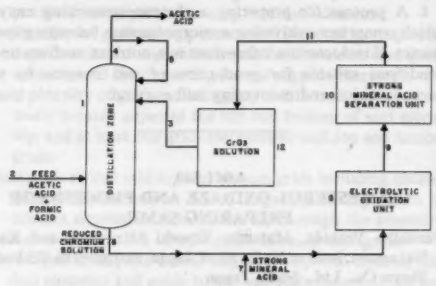
Filed Feb. 19, 1976, Ser. No. 659,570
Int. Cl.[2] B01D 3/34; C07C 15/10
U.S. Cl. 203—9 8 Claims

1. A process for the distillation of a readily polymerizable vinyl aromatic compound selected from the group consisting of styrene, substituted styrene, divinylbenzene and mixtures thereof, which comprises subjecting said compound to distillation conditions in the presence of an effective amount of a combination of phenothiazine ($C_{12}H_9NS$) and tertiarybutylcatechol (TBC) as a polymerization inhibitor system in the presence of oxygen.

4,061,546
PURIFICATION OF ACETIC ACID

Thomas C. Singleton, Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 29, 1976, Ser. No. 671,233
Int. Cl.[2] B01D 3/34
U.S. Cl. 203—31 6 Claims



1. The method for removing formic acid from acetic acid which consists essentially of introducing acetic acid substantially free of halide impurities but containing a minor amount of formic acid into a distillation zone below the midpoint thereof, introducing a compound of hexavalent chromium dissolved in a solvent selected from the group consisting of acetic acid, water and mixtures of acetic acid and water into the upper one-third of said distillation zone, the bottoms temperature of said column being maintained below about 160° C, removing overhead from said distillation zone an acetic acid stream containing less than 100 ppm of formic acid and removing from the bottom of said distillation zone a stream comprising acetic acid and the compound of chromium in its reduced state.

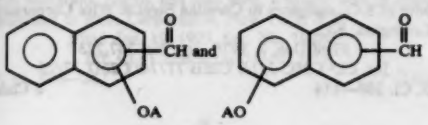
4,061,547
ACIDIC PLATING BATH AND ADDITIVES FOR ELECTRODEPOSITION OF BRIGHT TIN

William E. Rosenberg, Strongsville, Ohio, assignor to Columbia Chemical Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 593,311, July 7, 1975, Pat. No. 3,977,949. This application July 21, 1976, Ser. No. 707,437
Int. Cl.[2] C25D 3/32
U.S. Cl. 204—54 R 21 Claims

1. A primary tin plating brightening additive, comprising:

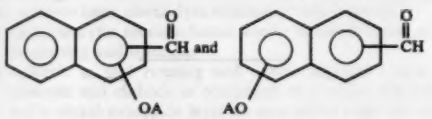
a substituted naphthalene carboxaldehyde of the following general formula:



where O is oxygen and where A is selected from the class consisting of hydrogen, hydroxy alkyl, polyalkoxy and 3-sulfopropyl, said alkyl containing from 2 to 8 carbon atoms, said polyalkoxy containing from 2 or 3 carbon atoms in the repeating unit wherein the number of repeating units ranges from 2 to about 40 per molecule, and said 3-sulfopropyl compound having the formula $—CH_2CH_2CH_2SO_3Z$ where Z is selected from the class consisting of hydrogen, Group 1A, and Group 2A of the Periodic Table, including from 1 to about 97 percent of at least one alpha unsaturated compound selected from the group consisting of carboxylic acids, amides, and esters for p ɔducing bright electrodeposits of tin from an aqueous acid plating bath.

4. An aqueous, acid tin electroplating bath containing stannous ions and sulfuric acid, comprising:

having dissolved therein as a brightener compound about 0.01 to about 0.2 grams/liter of a substituted naphthalene carboxaldehyde of the following general formula:



where O is oxygen and where A is selected from the group consisting of hydrogen, hydroxy alkyl, polyalkoxy and 3-6 sulfopropyl, said alkyl having from 2 to 8 carbon atoms, said polyalkoxy containing 2 or 3 carbon atoms in the repeating unit wherein the number of repeating units ranges from 2 to about 40 per molecule, and said 3-sulfopropyl compound having the formula $—CH_2CH_2CH_2SO_3Z$ where Z is selected from the class consisting of hydrogen, Group 1A, and Group 2A of the Periodic Table.

4,061,548

ELECTROLYTIC HYDROQUINONE PROCESS

Glenn C. Jones, and Ronald H. Meen, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 7, 1976, Ser. No. 693,451
Int. Cl.² C25B *3/02*
U.S. Cl. 204—78 **3 Claims**

1. In the process for the electrochemical oxidation of phenol to hydroquinone in an aqueous medium at a lead or lead-thallium alloy anode in an undivided cell, the improvement which comprises the inclusion in the aqueous medium of at least 50 ppm. of chromium ion.

4,061,549

ELECTROLYTIC CELL ANODE STRUCTURES CONTAINING COBALT SPINELS

Mark Jonathan Hazelrigg, Jr., and Donald Lee Caldwell, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 2, 1976, Ser. No. 702,251
Int. Cl.² C25B *1/14, 11/04*
U.S. Cl. 204—98 **20 Claims**

1. An anode material for use in electrolytic cells, said material comprising

an electroconductive substrate having coated thereon an effective amount of a bimetal oxide spinel having the formula $M_xCo_{3-x}O_4$ where $O<X\leqq 1$ and M is a metal selected from Groups IB, IIA, and IIB of the Periodic Table of the Elements.

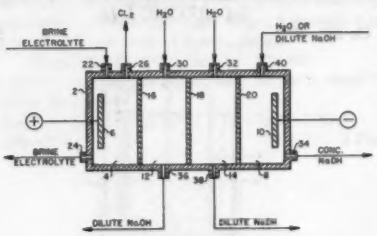
10. In electrolytic chlorine cells containing anodes and cathodes separated by aqueous NaCl electrolyte, said electrolyte being divided into catholyte and anolyte sections by membrane or diaphragm means, the improvement which comprises anode embodiments characterized as being electroconductive substrates having coated thereon an effective amount of bimetal spinel, $M_xCo_{3-x}O_4$, where X has a value of from about 0.1 to 1.0 and where M is a metal selected from the group consisting of metals of Groups IB, IIA, and IIB.

4,061,550

PROCESS FOR ELECTROLYSIS

Edward H. Cook, Jr., Lewiston, and Alvin T. Emery, Youngstown, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 388,702, Aug. 15, 1973. This application Oct. 10, 1975, Ser. No. 621,459
Int. Cl.² C25B *1/16, 1/26*
U.S. Cl. 204—98 **13 Claims**



1. A process for the electrochemical decomposition of an aqueous solution of an ionizable chemical compound selected from the group consisting of alkali metal halides and hydrochloric acid, which process comprises introducing an aqueous solution of said ionizable chemical compound into the anode compartment of an electrolytic cell; wherein said electrolytic cell comprises a cell body having an anode compartment containing an anode, a cathode compartment containing a cathode, and at least two buffer compartments therebetween, said anode compartment being separated from the next adjacent buffer compartment by a barrier which is substantially impervious to fluids and gases, said barriers being a membrane selected from the group consisting of a hydrolyzed copolymer of a perfluorinated hyrocarbon and a sulfonated perfluorovinyl ether, and a sulfostyrenated perfluorinated ethylene propylene polymer, said cathode compartment being separated from the next adjacent buffer compartment by a porous diaphragm; introducing a second aqueous solution into said buffer and cathode compartments, and effecting the electrolytic decomposition of said ionizable solution by passing an electric current between the anode and cathode of said cell.

4,061,551

PROCESS FOR EXTRACTION OF GALLIUM FROM ALKALINE GALLIUM-CONTAINING SOLUTIONS

Raisa Vasilievna Ivanova, ulitsa Udaltsova, 14, kv. 181; Arkady Andreevich Belsky, ulitsa Udaltsova, 14, kv. 65; Nikolai Alexandrovich Novikov, ulitsa Korolenko, 4/14, kv. 10; Nina Nikolaevna Alexeeva, ulitsa Obrucheva, 28, korpus 3, kv. 206; Ljudmila Nikolaevna Nikitina, Berezhkovskaya naberezhnaya, 12, kv. 323; Nina Andreevna Ljubimova, 11 Parkovaya ulitsa, 44, korpus 4, kv. 36, all of Moscow, and Anna Evgenievna Dotsenko, prospekt Lenina, 66, kv. 23, Balashikha, Moskovskoi oblasti, all of U.S.S.R.

Filed Aug. 15, 1975, Ser. No. 604,952
Int. Cl.[2] C25C 1/22
U.S. Cl. 204—105 R 9 Claims

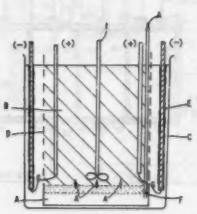
1. A process for the extraction of gallium from alkaline gallium-containing solutions comprising electrochemically reducing gallium on a liquid metal selected from the group consisting of gallium, an alloy of gallium and aluminum and an alloy of gallium, aluminum and zinc in an alternating electromagnetic field having an intensity of 1500 – 500,000 A/m.

4,061,552

ELECTROLYTIC PRODUCTION OF COPPER FROM ORES AND CONCENTRATES

Peter Kenneth Everett, Chatswood, Australia, assignor to Dextec Metallurgical Proprietary Limited, Australia

Filed Feb. 2, 1976, Ser. No. 654,391
Claims priority, application Australia, Feb. 14, 1975, 0615/75
Int. Cl.[2] C25C 1/12
U.S. Cl. 204—107 9 Claims



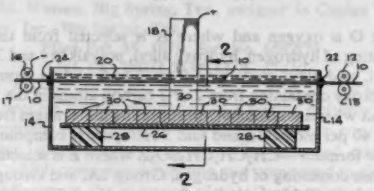
1. A process for extracting copper from a copper and iron bearing ore or concentrate and concomitantly plating out the extracted copper at the cathode of an electrochemical diaphragm cell which comprises forming a slurry of the ore or concentrate with an electrolyte in the anode compartment of the electrochemical diaphragm cell, intimately mixing finely dispersed oxygen bearing gas with the slurry and maintaining the slurry and the mixture at substantially atmospheric pressure throughout the process and at a temperature of from 50° C to the boiling point of the electrolyte, said electrolyte containing chloride ions in a concentration between that sufficient to maintain in solution any cuprous ions present and saturation, and passing current between the anode and cathode at a rate such that the hydrogen ions liberated at the anode maintain a pH of between 1.5 and less than 7.0 in the electrolyte throughout the process, whereby the iron solubilized in the process is substantially simultaneously precipitated as ferric oxide and sulphide sulphur oxidised under the conditions is substantially converted to elemental form and the copper is plated at the cathode.

4,061,553

ELECTROPLATING APPARATUS AND METHOD

Robert W. Alexander, Columbia, and John G. Keck, Lexington, both of S.C., assignors to Carolina Steel & Wire Corporation, Lexington, S.C.

Filed Dec. 3, 1976, Ser. No. 747,223
Int. Cl.[2] C25C 1/16; C25B 11/10; C25D 17/12
U.S. Cl. 204—114 6 Claims



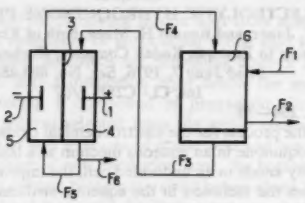
1. A zinc plating process for plating zinc on a metallic substrate comprising the steps of positioning the substrate in an electrolytic bath containing an ionized zinc salt, positioning an anode support means formed substantially of zirconium in the electrolytic bath, positioning zinc anode means on the anode support means and connecting a source of direct current across the anode support and the substrate to effect a plating operation onto the substrate.

4,061,554

ELECTROCHEMICAL METHOD FOR PRODUCING OXYGEN

Nicole Chillier-Duchatel, Sevres, and Bernard Verger, Chevreuse, both of France, assignors to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie", Paris, France

Filed Apr. 14, 1976, Ser. No. 676,751
Claims priority, application France, Apr. 24, 1975, 50.12843
Int. Cl.[2] C25B 1/02
U.S. Cl. 204—129 12 Claims



1. Electrochemical method for producing oxygen, comprising successively:

reacting air in a basic medium with the reduced form of the anthraquinone 2–7 disulphonate of an alkali metal to form a peroxide which spontaneously decomposes into (i) hydrogen peroxide and (ii) the oxidised form of said anthraquinone;

electrochemically oxidising said hydrogen peroxide to form oxygen;

recovering said oxygen;

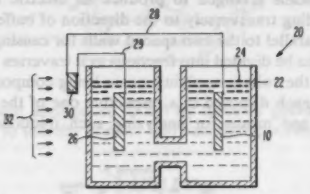
electrochemically reducing said oxidised form of said anthraquinone to regenerate said reduced form of said anthraquinone; and

recycling said reduced form, to react with said air.

4,061,555
WATER PHOTOLYSIS APPARATUS

Isamo Miyatani, Tokyo, and Isao Sato, Kodaira, both of Japan, assignors to RCA Corporation, New York, N.Y.

Filed Jan. 19, 1977, Ser. No. 760,551
Int. Cl.[2] C25B 9/00, 11/02, 1/02
U.S. Cl. 204—242 7 Claims



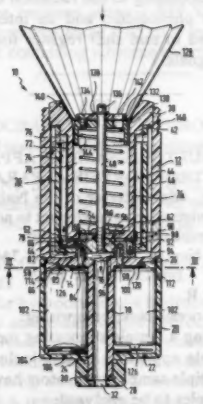
1. A cathode capable of being utilized in a photolysis apparatus comprising:
a nickel substrate; and
a nickel monoxide layer on said nickel substrate with a plurality of spaced apart grooves, said grooves extending through said nickel oxide layer and into said nickel substrate.

3. A photolysis apparatus comprising:
a housing;
an aqueous basic electrolyte solution in said housing;
a photocatalytic semiconductor anode in said housing and contacting said solution;
a cathode in said housing and contacting said solution, wherein said cathode is comprised of a nickel substrate and a nickel monoxide layer on said nickel substrate surfaces, and further having a plurality of spaced apart grooves, said grooves extending through said nickel oxide layer and exposing said nickel substrate; and
an electrical biasing means in series with said anode and cathode.

4,061,556
PORTABLE ELECTROLYTIC APPARATUS FOR PURIFYING DRINKING WATER

August Reis, Munich; Fritz Fend, Regensburg, and Karl Hils, Hambach, all of Germany, assignors to Sachs-Systemtechnik GmbH, Schweinfurt am Main, Germany

Filed Mar. 10, 1977, Ser. No. 776,238
Claims priority, application Germany, Mar. 10, 1976, 2609846
Int. Cl.[2] C02B 1/82
U.S. Cl. 204—271 11 Claims

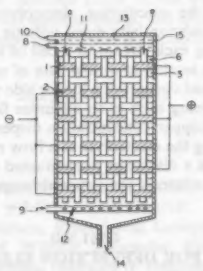


1. Apparatus for purifying drinking water comprising:
a. a housing having first and second terminal parts;
b. means for setting up said housing in an operating position in which said first part is upwardly offset from said second part,
1. said housing defining therein a receiving chamber and an electrolytic cell,
2. said chamber communicating with an upwardly open filling aperture in said first part;
c. first conduit means connecting a bottom portion of said chamber downwardly spaced from said filling aperture with an inlet portion of said cell;
d. second conduit means connecting an outlet portion of said cell upwardly spaced from said inlet portion, but lower than said filling aperture in said operating position, with a discharge aperture in said second part,
1. said chamber, said cell, and said first and second conduit means defining a continuous path of liquid flow from said filling aperture to said discharge aperture,
2. said path extending downwardly in said chamber, upwardly in said cell, and downwardly in said second conduit means;
e. two electrodes in said cell offset from said path in opposite, transverse directions; and
f. supply means for supplying direct current to said electrodes for passage of the current in said cell through liquid flowing in said path.

4,061,557
ASSEMBLY OF ELECTRODES

Kazuo Nishizawa; Ken Higashitsuji, and Yuji Mori, all of Kyoto, Japan, assignors to Marubishi Yuka Kogyo Kabushiki Kaisha and Kazuo Nishizawa, both of Kyoto, Japan

Filed May 19, 1975, Ser. No. 578,981
Claims priority, application Japan, May 24, 1974, 49-057927; Oct. 19, 1974, 49-119888
Int. Cl.[2] C25B 9/00, 9/02; C25C 7/00, 7/02
U.S. Cl. 204—277 3 Claims



1. A fabric suitable for use as an electrode in electrochemical processes which comprises a woven or knitted fabric of a non-conductive material wherein a plurality of flexible elongated and anodic and cathodic conductive elements are incorporated so as to be substantially parallel, the adjacent conductive elements being separated from one another by said fabric forming non-conductive material, a first lead means for connecting at least one of said anodic conductive elements with the positive pole of a DC source and a second lead means for connecting at least one of the cathodic conductive elements with the negative pole of said DC source.

4,061,558

ELECTRODE

Shunjiro Saito; Kazuhide Aue, and Nobuei Shimojo, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed June 9, 1976, Ser. No. 694,467
Claims priority, application Japan, June 9, 1975, 50-69392
Int. Cl.² C25B *11/08, 11/10*
U.S. Cl. 204—290 F 7 Claims

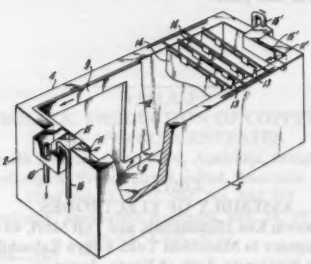
1. An electrode which comprises a conductive substrate coated with a composition consisting essentially of from 5–40 mole percent palladium oxide 2–10 mole percent ruthenium oxide, and 93–50 mole percent of tin oxide and titanium oxide, wherein the titanium oxide is less than 40 percent of the tin oxide.

4,061,559

ELECTROLYTIC CELL AND CIRCULATING METHOD FOR ELECTROLYTE

Tatsuzo Kitamura, Yokohama, and Haruji Inaba, Hachiohji, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Nihonbashi-Muromachi, Japan

Filed Apr. 23, 1976, Ser. No. 679,859
Claims priority, application Japan, Sept. 11, 1975, 50-110368
Int. Cl.² C25C *1/12, 7/00, 7/06*
U.S. Cl. 204—106 5 Claims



1. A method of circulating an electrolyte in the electrolytic refining of copper in which plates of pure copper are electrodeposited on a cathode surface and anode plates of crude copper are dissolved in the electrolyte while using a current density of more than 250 A/m², comprising the following steps:

A. dividing the circulating electrolyte into two supply streams of substantially equal volume and flow rate;

B. introducing each stream to a cell of substantially rectangular cross section at a flow rate of more than 15 l/min. from opposed corners of a longer side wall of the cell, said flow rate being such as to minimize flotation of resulting slime and copper concentration dispersion; and

C. discharging the electrolyte at a flow rate of more than 30 l/min. from a discharge port situated at a central part on the inner surface of the opposed longer side wall thereof.

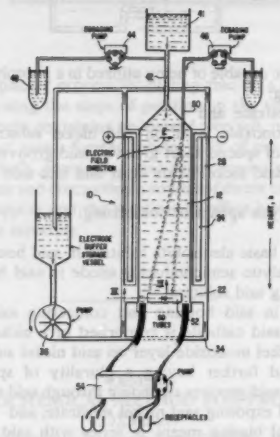
4,061,560

APPARATUS FOR DEFLECTION ELECTROPHORESIS

Kurt Hannig, Krailling, and Hanns Wirth, Hohenpeissenberg, both of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V., Gottingen, Germany

Filed Feb. 27, 1976, Ser. No. 662,089
Claims priority, application Germany, Feb. 28, 1975, 2508844
Int. Cl.² G01N *27/26*
U.S. Cl. 204—299 R 12 Claims

1. In apparatus for performing a continuous, free-film deflection electrophoresis procedure, the apparatus including: means defining a separating chamber having two spaced parallel walls delimiting opposite boundaries of a separating chamber gap, and two electrode chambers each disposed adjacent a respective opposite, lateral edge of the gap; two ion transmitting membranes each separating a respective electrode chamber from the separating chamber gap; first supply means for supplying a buffer solution to one end of the gap so that the solution flows in the form of a thin layer through the gap; second supply means disposed downstream of the first supply means for introducing into the thin buffer solution layer a spatially narrowly defined stream of a sample mixture; voltage applying means arranged to produce an electric separating field extending transversely to the direction of buffer solution flow and parallel to the two spaced walls for causing the sample stream to be divided into fractions as it traverses the length of the gap, the voltage applying means being composed of two electrodes each disposed in a respective one of the electrode chambers; and means for analyzing such fractions, the improvement wherein said apparatus comprises third supply means for introducing controlled quantities of an adjuvant fluid into the buffer solution upstream of the point of introduction of the sample mixture into the buffer solution layer, and wherein said means for analyzing comprises: a light source disposed to one side of said separating chamber gap; and a series of photodiodes disposed to the other side of said separating chamber gap and extending transversely to the direction of buffer solution flow through said gap; a shift register having a plurality of stages each operatively coupled to a respective one of said photodiodes in a manner to permit each said stage to store signals corresponding to the radiation energy impinging on the associated photodiode, and an interrogation device operatively coupled to said shift register for serially reading out such stored signals.



4,061,561

AUTOMATIC MULTIPLE-SAMPLE APPLICATOR AND ELECTROPHORESIS APPARATUS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Benjamin W. Grunbaum, Moraga, Calif.

Filed Nov. 24, 1976, Ser. No. 744,574
Int. Cl.² G01N *27/26*
U.S. Cl. 204—299 R 12 Claims

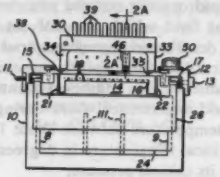
1. An electrophoresis tank, comprising:

means for holding a sample-supporting medium;

a multiple-sample applicator means, including individually operable multiple-sample applicators having tips for holding fluid samples to be analyzed;

a cover for said tank adapted to receive said applicator tips through corresponding openings therein; and

means coacting with said multiple-sample applicators for releasing said applicators simultaneously, to thereby permit said applicators to fall by force of gravity into said tank to thereby contact said sample-supporting medium.

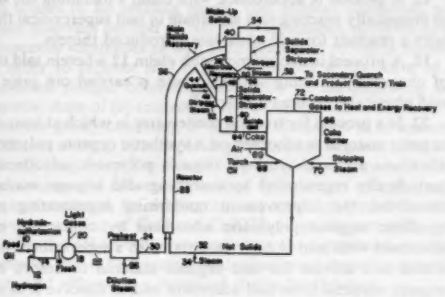


4,061,562

THERMAL CRACKING OF HYDRODESULFURIZED RESIDUAL PETROLEUM OILS

Joel Drexler McKinney; Raynor T. Sebulsky, both of Pittsburgh, and Francis Edmund Wynne, Jr., Allison Park, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed July 12, 1976, Ser. No. 704,454
Int. Cl.² C07C *11/04*; C10G *9/32*
U.S. Cl. 208—61 22 Claims



1. A process comprising passing a petroleum residual oil through a catalytic hydrodesulfurization zone in the presence of hydrogen at a temperature between 650° and 900° F. hydrogen being chemically combined with said oil during said hydrodesulfurization step, and then passing hydrodesulfurized residual oil through a thermal cracking zone together with entrained insert hot solids as the heat source and a diluent gas at a temperature between about 1,300° and 2,500° F. for a residence time between about 0.05 to 2 seconds to produce a cracked product containing ethylene and molecular hydrogen.

4,061,563

HYDROCRACKING OF HYDROCARBONS

Lee Hilfman, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 599,561, July 28, 1975, Pat. No. 4,003,956, which is a continuation-in-part of Ser. No. 466,759, May 3, 1974, Pat. No. 3,931,048. This application Aug. 23, 1976, Ser. No. 716,922
Int. Cl.² C10G *13/04*; B01J *29/12*
U.S. Cl. 208—111 3 Claims

1. A process for hydrocracking a hydrocarbonaceous charge stock into lower molecular weight hydrocarbons, which process comprises reacting said charge stock with hydrogen at hydrocracking conditions, and in contact with a catalytic composite consisting essentially of a combination of a nickel component, and a tungsten component with a silica-alumina carrier material wherein said carrier material is co-gelled silica-alumina consisting of from about 43 percent to about 57 percent by weight alumina and from about 57 to about 43 percent by weight silica and wherein said components are present in amounts sufficient to result in the composite containing on an elemental basis, about 2 to about 10 percent by weight of the nickel component and about 8 to about 20 percent by weight of the tungsten components, and separating the resulting reaction zone effluent to recover said lower molecular weight hydrocarbons.

4,061,564

TREATMENT OF SOLUTIONS CONTAINING IMPURE METALS

Achille De Schepper, Lichtaart, and Antoine Van Peteghem, Olen, both of Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Mar. 23, 1976, Ser. No. 669,586
Claims priority, application Luxembourg, Apr. 18, 1975, 72319
Int. Cl.² B01D *11/04*
U.S. Cl. 210—21 14 Claims

1. A process for treating a solution from the bleeding of copper electrorefining or copper electrowinning, said solution being an aqueous sulfuric acid solution containing arsenic and copper, said process comprising contacting the solution with an organic phase comprising an organophosphoric compound having the general formula $(RO)_3P=O$ wherein R represents an unsubstituted or substituted alkyl, aryl or aralkyl group, while maintaining a temperature of between 10° and 60° and an organic phase/aqueous phase ratio of between 0.1 and 5, whereby arsenic and acid are extracted from the aqueous phase to the organic phase and copper remains in the aqueous phase, and separating the resultant pregnant organic phase from the aqueous phase.

14. A process for treating an aqueous sulfuric acid solution containing arsenic and copper, said process comprising contacting the aqueous solution with an organic phase comprising an organophosphoric compound having the general formula $(RO)_3P=O$ wherein R represents an unsubstituted or substituted alkyl, aryl or aralkyl group, while maintaining a temperature of between 10° and 60° C and an organic phase/aqueous phase ratio of between 0.1 and 5, whereby arsenic and acid are extracted from the aqueous phase to the organic phase and copper remains in the aqueous phase, and separating the resultant pregnant organic phase from the aqueous phase.

4,061,565

SORPTION OF WEAK ORGANIC ACIDS FROM WATER BY POLYURETHANE

Owen Victor Washburn, Fredericton; Georgeos Konstandenos Kouvarellis, and William Alexander Ferguson, both of Guelph, all of Canada, assignors to Uniroyal, Ltd., Canada

Filed Sept. 16, 1975, Ser. No. 613,846
Claims priority, application Canada, July 8, 1975, 231051
Int. Cl.² B01D *15/06*
U.S. Cl. 210—32 27 Claims

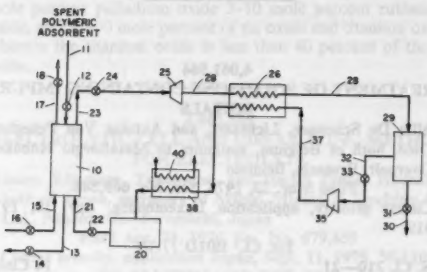
1. The method of extracting a weakly acidic, monomeric organic substance from an aqueous solution thereof which comprises contacting said solution, having a pH value less than the pK_a value of said acidic substance, with granules of unblown polyurethane resin for a sufficient time to permit absorption of a substantial amount of said acidic substance from said solution by said resin granules.

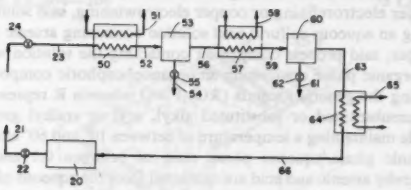
4,061,566

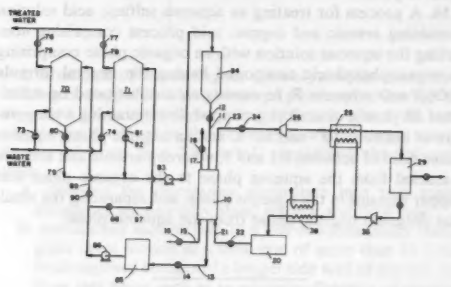
PROCESS USING A SUPERCRITICAL FLUID FOR REGENERATING SYNTHETIC ORGANIC POLYMERIC ADSORBENTS AND WASTEWATER TREATMENT EMBODYING THE SAME

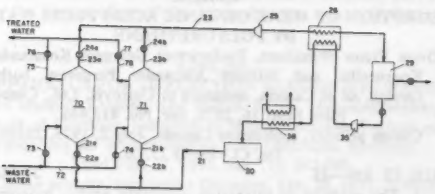
Michael Modell, Cambridge, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 512,124, Oct. 4, 1974. This application Apr. 15, 1976, Ser. No. 677,387
Int. Cl.[2] B01D *15/06;* B01J *1/09, 31/40*
U.S. Cl. 210—32 24 Claims









1. A process for treating water to remove at least one organic material therefrom, comprising the steps of

a. contacting a synthetic organic polymeric adsorbent with a stream of water containing said organic material under conditions such that said organic material is adsorbed as an adsorbate on said synthetic organic polymeric adsorbent;

b. then contacting said synthetic organic polymeric adsorbent with said organic material adsorbed thereon with a supercritical fluid which is a solvent for said organic material to desorb said organic material and to dissolve it in said supercritical fluid, thereby to render said adsorbent capable of adsorbing an additional quantity of said organic material, said supercritical fluid during said contacting being at a temperature between about 1.01 and about 1.3 times its critical temperature in degrees K and at a pressure above its critical pressure;

c. separating said supercritical fluid with said dissolved organic material from said adsorbent;

d. subjecting said supercritical fluid containing said organic material dissolved therein to physical treatment which renders said fluid a nonsolvent for said organic material thereby to form a two-phase system comprising said fluid in a nonsolvent state and said organic material;

e. separating the resulting two-phase system into nonsolvent state fluid and organic material; and

f. subjecting said nonsolvent state fluid subsequent to said separating step to a physical treatment which converts it to a solvent state supercritical fluid making it a solvent for said organic material.

3. A process in accordance with claim 1 wherein said supercritical fluid is carbon dioxide.

12. A process in accordance with claim 1 including the step of chemically reacting said adsorbate in said supercritical fluid with a reactant for said adsorbate introduced therein.

13. A process in accordance with claim 12 wherein said step of chemically reacting said adsorbate is carried out prior to said physical treatment of step (d).

23. In a process for treating wastewater in which at least one organic material is adsorbed on a synthetic organic polymeric adsorbent and said synthetic organic polymeric adsorbent is periodically regenerated by desorbing said organic material therefrom, the improvement comprising regenerating said synthetic organic polymeric adsorbent by contacting said adsorbent with said organic material with a supercritical fluid which is a solvent for said organic material to desorb said organic material from said adsorbent and to dissolve it in said supercritical fluid thereby to render said adsorbent capable of adsorbing an additional quantity of said organic material; the temperature of said supercritical fluid ranging between about 1.01 and 1.3 times the critical temperature in degrees K of said fluid and the pressure being above the critical pressure of said fluid.

4,061,567

METHOD FOR ADSORPTION OF OILS

Yoshinari Kobayashi, Kagawa; Ryukichi Matuo, Takamatsu, and Masashi Nishiyama, Kanonji, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Feb. 23, 1977, Ser. No. 771,258
Claims priority, application Japan, Mar. 1, 1976, 51-22450
Int. Cl.[2] C02B *9/02*
U.S. Cl. 210—40 5 Claims

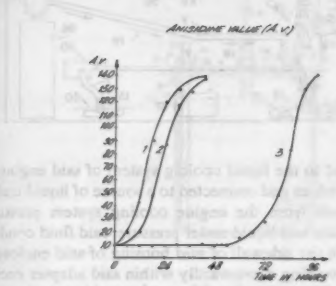
1. A method for the adsorption of oils floating on or suspended in water comprising the step of bringing an oil adsorbing material consisting essentially of kapok fibers into contact with said oils.

4,061,568

METHOD FOR RECOVERING AND STABILIZING FAT AND FATTY SUBSTANCES AS WELL AS PROTEINS AND PROTEINOUS SUBSTANCES FROM PROCESS WATER

Gunnar Hall, Oslo, Norway, assignor to A/S Apothekernes Laboratorium for Specialpraeparater, Oslo, Norway

Continuation-in-part of Ser. No. 440,574, Feb. 2, 1974, abandoned. This application Dec. 16, 1975, Ser. No. 641,594
Claims priority, application Norway, Feb. 9, 1973, 73539
Int. Cl.[2] C02B *1/20*
U.S. Cl. 210—44 **3 Claims**



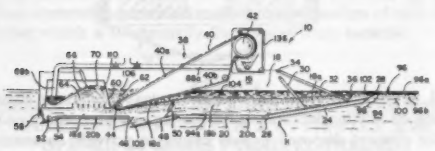
1. A method for treatment of aqueous effluents from slaughter houses or fat refining plants, said effluent containing organic materials defined as fats, fatty substances, proteins, proteinaceous substances as well as deterioration products thereof in order to recover said organic materials in the form of a stabilized sludge, consisting essentially in the following sequential steps of (a) contacting the effluents with ions selected from the group consisting of iron and aluminum in an amount sufficient to bind, by complexing the present organic material, (b) reducing the pH to below 4 by addition of a mineral acid and mixing said effluent for a time sufficient to complex said organic material, (c) adding a compound selected from the group consisting of CaO and $Ca(OH)_2$ in an amount sufficient to raise the pH to 6–9 to coprecipitate the complexed organic material, and (d) separating said complexed organic material from said effluent as a stabilized sludge by flotation.

4,061,569

OIL RECOVERY APPARATUS AND METHOD

John A. Bennett, 5660 Westhaven Road, West Vancouver, British Columbia; Ian R. McAllister, 3578 Quesnel Drive, Vancouver, British Columbia, and Howard Welsh, 1276 Premier St., North Vancouver, British Columbia, all of Canada

Continuation-in-part of Ser. No. 567,426, April 11, 1975, abandoned, which is a continuation of Ser. No. 464,540, April 26, 1974, abandoned. This application Feb. 26, 1976, Ser. No. 661,769
Int. Cl.[2] E02B *15/04*
U.S. Cl. 210—83 **48 Claims**



1. A method of collecting oil from a body of water on which there is an oil polluted surface layer comprising an upper surface layer portion of a relatively higher oil content and a second lower surface layer portion of an oil/water mixture of relatively less oil content, said method comprising:

a. directing said layer as a liquid flow into a hull constructed and arranged to float on the body of water, said hull having front and rear ends, and side and bottom walls defining a through oil recovery passageway, said side and bottom walls defining:
   1. a first enlarged passageway section,
   2. a second oil recovery passageway section at a first stage oil recovery area, and
   3. a third oil recovery passageway section at a second stage oil recovery area,

b. initially passing said layer at a first velocity over a front inlet member mounted to the front end of said hull for vertical adjustment, said inlet member having a front lower edge portion defining a front passageway inlet constructed and arranged to receive a flow of said polluted surface layer over said lower edge portion,

c. positioning the front inlet member by actuating means vertically to an operational position where the lower edge portion of the front inlet member receives the flow of the polluted surface layer thereover,

d. then passing said surface layer as a liquid flow rearwardly through said first enlarged passageway section which is substantially unobstructed and has a cross sectional flow area and depth substantially greater than that of said inlet to effect a substantial reduction in flow velocity and a substantial increase in depth of at least said upper layer portion, and also to effect a third lowermost layer portion of relatively oil free water by upward flotation of oil in said second layer portion to said upper layer portion, said enlarged passageway section being defined by first bottom and side wall portions, said first bottom wall portion being positioned at a level below that of said front lower edge portion of the front inlet member,

e. passing said first and second layers from said enlarged passageway section through said second oil recovery passageway section at said first stage oil removal area and collecting at least a substantial portion of said upper layer portion by engaging said upper layer portion with a downwardly and rearwardly traveling oil absorptive belt that travels continuously from an upward forward location at a downward slant to a rearward location below the surface level of said first layer, whereby oil from the upper layer portion is absorbed into said belt, said second passageway section being defined by second bottom and side wall portions positioned rearwardly of the first bottom and side wall portions, with the second bottom wall portion being positioned at a level below that of the lower rear end of the oil recovery belt,

f. carrying the absorbed oil upwardly by said belt and then removing collected oil from said belt at said upper location,

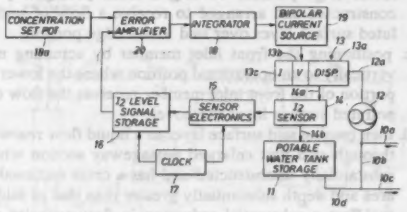
g. directing at least a substantial portion of the remaining liquid flow through said third oil recovery passageway section at said second oil recovery area to cause oil to separate by flotation from the remaining liquid flow and confining the oil so collected in the second oil recovery area, said second oil recovery area having second oil recovery means located rearwardly of said oil recovery belt, said second oil recovery means comprising rear and side enclosure walls extending upwardly above the level of the lower rear end of the belt and defining an oil collecting enclosure positioned rearwardly of the lower rear end of the belt, said third passageway section being defined by third bottom and side wall portions positioned rearwardly of said second bottom and side wall portions, with the third bottom and side wall portions being positioned at a level below the rear and side enclosure walls to define said third passageway section passing beneath the oil collecting enclosure defined by the rear and side enclosure walls, and

h. discharging liquid flow remaining from the second oil recovery area back to the body of water through means defining a rear opening leading from said third passageway section.

4,061,570
IODINE GENERATOR FOR RECLAIMED WATER PURIFICATION

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Richard A. Wynveen, Pepper Pike; James D. Powell, Euclid, and Franz H. Schubert, Mentor, all of Ohio

Filed Apr. 25, 1975, Ser. No. 571,459
Int. Cl.² B01J 1/06, 4/02; G01N 21/02, 33/18
U.S. Cl. 210—96 M **7 Claims**



1. A system for iodinating water comprising

a. an iodine dispensing means having a first and a second chamber separated by an electro-chemical valve means, said first chamber being adapted to receive a slurry of iodine crystals, said second chamber having an inlet and an outlet for the flow of water to be iodinated, said electro—chemical valve means having an anion exchange membrane sandwiched between two metal screens which form electrodes, each of said metal screen electrodes being electrically coupled to an outlet terminal, said electro-chemical valve means being responsive to an electrical current for passing iodine across said anion exchange membrane,

b. an iodine sensor means for detecting the concentration of iodine in the iodinated water, said iodine sensor means having an inlet and an outlet for the flow of iodinated water, said inlet for the iodine sensor means being fluidly coupled to said outlet of the second chamber of the iodine dispensing means, said iodine sensor means further having means for producing an electrical signal representative of the iodine concentration in the iodinated water flowing through the iodine sensor means,

c. reference means for providing a present electrical signal representative of a desired iodine concentration,

d. comparator means electrically coupled to said iodine sensor means and said reference means for comparing the electrical signal from said iodine sensor means with the electrical signal from said reference means and for producing an error signal in the event of a difference in signal values, and

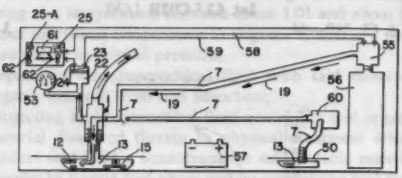
e. means for supplying said error signal to said outlet terminals of said electrodes.

4,061,571
MARINE WATER INLET DEVICE

Philip M. Banner, P.O. Box 307, Massapequa, N.Y. 11758

Continuation-in-part of Ser. No. 343,121, March 20, 1973, Pat. No. 3,864,260. This application Nov. 19, 1974, Ser. No. 525,100
Int. Cl.² B01D 35/16
U.S. Cl. 210—130 **4 Claims**

1. A marine water inlet device in combination with a marine vessel and providing the function of cleaning the water inlet of an engine having water flowing therethrough comprising, in combination, a marine vessel with a strainer located on an exterior surface of the hull of said marine vessel, said strainer including a chamber defined by an upper surface, depending sidewalls, and a lower surface, said upper surface being located adjacent the exterior surface of the hull of said marine vessel, inlet means for introducing water in said strainer chamber including perforate openings located in said chamber lower surface, outlet means located on said upper surface of said chamber including an enclosure adapter for passing said water from said chamber through said hull of said marine vessel and in fluid communication with said engine, said adapter enclosure having a housing with sidewalls and an open top and an open bottom, said open bottom being sealingly connected to an inlet end of a conduit with the opposite end of said conduit

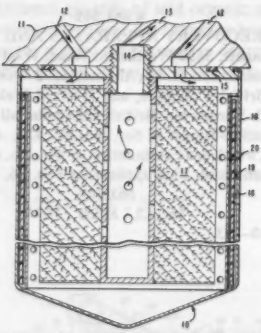


being connected to the liquid cooling system of said engine, a fluid conduit with an end connected to a source of liquid under pressure separate from the engine cooling system pressure means to maintain said liquid under pressure, said fluid conduit passing through the sidewall of said housing of said enclosure adapter and extending downwardly within said adapter enclosure into said strainer chamber for backwash of said perforate openings in said chamber.

4,061,572
OIL FILTER

Lester Samuel Cohen, Broomall, Pa., and William Dein [illegible] Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 11, 1974, Ser. No. 449,989
Disclosure was also published under second Trial Voluntary protest program on Mar. 30, 1976
Int. Cl.² B01D 11/00
U.S. Cl. 210—168 **1 Claim**



1. In an oil filter, for use with an internal combustion engine using circulating lubricating oil, having an outer casing and a filter element disposed in said casing to provide an annular passage around said element the improvement comprising:

1. a sheet of an oil-soluble, solid ethylene copolymer comprising about 25 to 55% by weight ethylene, 35 to 75% by weight propylene and up to 10% by weight of 1,4-hexadiene lining the inner side walls of said casing and

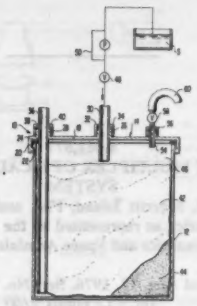
2. a perforated metal sheet overlaying the copolymer sheet, said perforations of a size to limit contact of the copolymer sheet with the circulating oil over its normal life.

4,061,573

PORTABLE OIL-WATER SEPARATION APPARATUS

Richard D. Biron, Acton, Mass., assignor to Seagull Industries, Inc., Acton, Mass.

Filed Sept. 18, 1975, Ser. No. 614,818
Int. Cl.[2] B01D *27/02*
U.S. Cl. 210—282 5 Claims



1. A portable, rechargeable oil-water separation apparatus comprising a separation chamber defined by a generally cylindrical container having a closed bottom end and an open top end, a removable closure member adapted to fit on and sealingly close said open end, an inlet and an outlet formed in said removable closure and communicating with said chamber, said inlet including conduit having an open end positioned in the top portion of said chamber and spaced below said closure, said outlet including a discharge conduit having its open end positioned within said chamber adjacent said closed bottom end, means supplying an oil-water mixture under pressure to said chamber through said inlet conduit, flow restricting means in said inlet conduit for restricting the rate of flow of said oil-water mixture into said chamber, a supply of oleophilic, hydrophobic ground foamed polymeric material in said chamber between said open ends of said inlet and said discharge conduits, said foamed polymeric material being a closed cell urethane foam having a density within the range of 1.7 to 2.3 pounds per cubic foot and being ground so that at least a major portion of the ground particles are of a size within the range of one-fourth to one-half inch, said foamed material being contained within at least one closed bag formed from a porous hydrophilic material with said bag and said foamed material contained therein being packed into and substantially filling said chamber between said open ends of said inlet and discharge conduits with a portion of said chamber between said closure and said open end of said inlet conduit being substantially free of said foam material whereby, when said chamber is filled with water and an oil-water mixture is circulated therethrough from said inlet to said outlet conduits, the oil-water mixture is discharged into said chamber below the surface of the liquid therein and must flow downwardly through said bag of ground foamed plastic material and oil attracted by said foam material is permitted to float to said portion of said container which is substantially free of said foam material.

4,061,574

ASSEMBLY OF PERMEABLE HOLLOW FIBERS AND A TUBESHEET SUPPORTABLE AT ITS FACE AND OPENED BY BORES PARALLEL THERETO

George B. Clark, Clayton, Calif., assignor to The Dow Chemical Company, Midland, Mich.

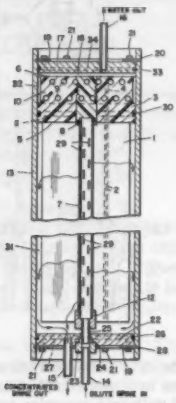
Filed Feb. 14, 1977, Ser. No. 768,524
Int. Cl.[2] B01D *13/00, 31/00*
U.S. Cl. 210—321 R 10 Claims

1. A hollow fiber and tubesheet assembly having utility as a component of a permeability separation apparatus and comprising a non-random fiber bundle having two ends, one of which is potted in a shaped, solid resin body which constitutes said tubesheet and is the only end of said bundle potted therein, said bundle consisting of permeable, hollow fiber lengths,

said tubesheet having a first face, from which the unpotted portions of said fiber lengths depend, and a second, opposed face, the portions of the fiber lengths potted in said tubesheet extending therethrough from said first face and terminating at or adjacent to said second face,

at least half of said potted fiber portions being interrupted by and opening into bores in the tubesheet, each of which extends to and opens upon a surface of said tubesheet other than said first and second faces,

said assembly being adapted to be disposed, together with cooperating sealing and permeate collecting means, in a



pressurizeable casing fitted with appropriately located feed fluid ingress and egress means and with permeate egress means, in such manner that:

a. when fluid is supplied under pressure to the exterior surfaces of the unpotted fiber portions, it will permeate through the fiber walls, pass through the fiber lumen and said bores to said permeate collecting means and out through said permeate egress means;

b. said assembly is positioned in said casing with said second face in contact with at least a major portion of an end member thereof so that the tubesheet is supported against the pressure exerted by said fluid on said first face, and

c. egress of permeate from the fiber lumens is not interfered with by said contact.

4,061,575

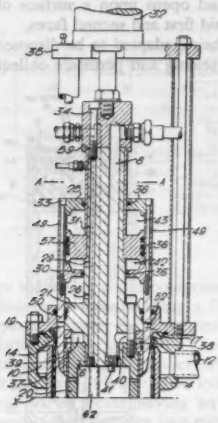
FILTRATION APPARATUS

Raymond Thomas Randle, Hartlepool, England, assignor to Steetley (Mfg.) Limited, England

Filed Aug. 1, 1975, Ser. No. 601,055
Claims priority, application United Kingdom, Aug. 7, 1974, 34851/74
Int. Cl.[2] B01D *29/04*
U.S. Cl. 210—350 2 Claims

1. In a candle displacement filtration apparatus of the kind which comprises a cylindrical housing accommodating a hollow perforated cylindrical body or candle, and impermeable elastic sleeve disposed within the annular space defined by the inside of the housing and the outside of the cylindrical body and circumferentially attached at its ends to the housing of the cylindrical body, thereby dividing the annular space into an inner filtration compartment and an outer pressure applying compartment, a filter element disposed around and supported by the cylindrical body, outlet means for the discharge of filtrate which has passed through the filter element into the cylindrical body, an inlet into the inner compartment for li-

quid/solid mixtures, an inlet into the outer compartment for a hydraulic fluid under pressure, means for displacing the hollow perforated cylindrical body, or candle, axially relative to the cylindrical housing so that the cake adhering to the candle is exposed and can be discharged, and an inlet into the interior of the cylindrical body for compressed air, the improvement wherein the inlet to the inner compartment for liquid/solid mixtures comprises a substantially cylindrical chamber provided with circumferentially spaced apertures adapted to connect with the inner compartment, said chamber being located



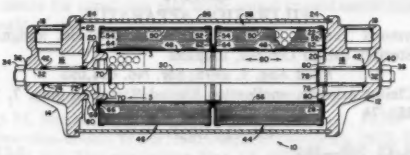
at one end of the cylindrical body in an extension thereof, an inlet line or lines into said chamber and a hollow cylindrical member coaxial with said extension and movably constructed and arranged to cover or expose said apertures and to form with said extension a cell the ends of which are defined by flanges extending from said hollow cylindrical member and slidably engaging with the walls of said extension, said cell being divided by a piston integral with said extension, means being provided on either side of said piston for supplying or venting air to or from either side of the cell.

4,061,576

INLINE OIL FILTER ASSEMBLY

Charles William Hilgert, and Raymond Joseph Lobmeyer, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Continuation of Ser. No. 595,274, July 14, 1975, abandoned. This application Feb. 16, 1977, Ser. No. 768,996
Int. Cl.[2] C02C 1/14
U.S. Cl. 210—437 **3 Claims**



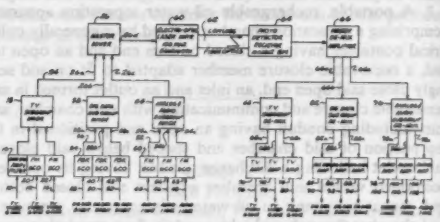
1. An oil filter assembly, comprising: a hollow housing having a cylindrical wall; an annular filter element including inner and outer cylindrical perforated shells disposed concentrically in the housing and having opposite ends connected by first and second annular end plates; first and second end members respectively sealingly engaged with the opposite ends of the housing; a center bolt passing through the end members; fastening means received on the bolt for holding the end members in place; said first and second end members respectively having inlet and outlet passages extending therethrough; said element being disposed with its first end plate spaced from the first end member; member means preventing fluid from flowing centrally through the first annular end plate of the element; first and second annular seals received on the center bolt and seated against the first end member and the member means; and biasing means acting between the first and second annular seals for retaining the latter in place to prevent leakage along the center bolt and through the first end member and the member means.

4,061,577

FIBER OPTIC MULTIPLEX OPTICAL TRANSMISSION SYSTEM

Charles H. Bell, Merritt Island, Fla., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 18, 1976, Ser. No. 715,485
Int. Cl.[2] H04B 9/00
U.S. Cl. 250—199 **6 Claims**



1. A multiplex optical transmission system for simultaneously transmitting and receiving a plurality of signals while minimizing external interference, said system comprising:

a. a plurality of video signals,

b. means for blocking said video signals into respective frequency ranges,

c. a video subgroup mixer means for mixing said video signals of said frequency ranges and generating a single composite video signal,

d. a plurality of data signals,

e. means for blocking said data signals into respective data frequency ranges,

f. a data subgroup mixer means for mixing said data signals of said frequency ranges and generating a composite data signal,

g. a master mixer connected to the output of said video subgroup mixer and said data subgroup mixer producing a composite electrical signal,

h. an optical transmitter connected to said master mixer converting said composite electrical signal into an optical signal,

i. a fiber optic cable having one end connected to said optic transmitter,

j. an optical receiver connected to the other end of said fiber optic cable receiving said optical signal being transmitted over said fiber optic cable and converting said optical signal back to a composite electrical signal,

k. a de-multiplexer connected to the output of said optic receiver separating said composite siganl into a composite video signal and a composite data signal,

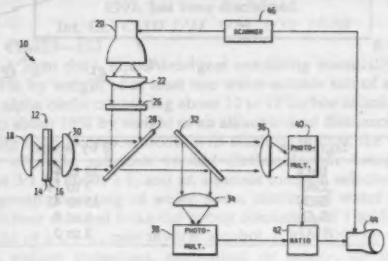
l. means connected to said de-multiplexer for separating said composite video signal and said composite data signals into individual video signals of respective frequencies and into individual data signals of respective frequencies.

4,061,578

INFRARED DETECTION AND IMAGING, METHOD AND APPARATUS

Marcos Kleinerman, South Point Road, Webster, Mass. 01570

Filed Apr. 5, 1976, Ser. No. 673,639
Int. Cl.[2] H01J *31/50*; G01N *21/38*
U.S. Cl. 250—330 15 Claims



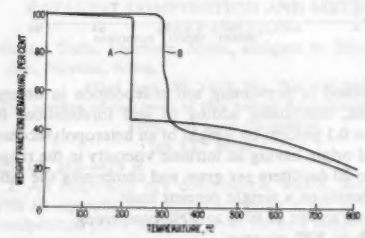
1. A method for converting an infrared image comprising the steps of focusing an infrared image on an infrared absorbing film having applied thereon a thin layer of a luminescent material, the luminescence of said material being produced upon irradiation with ultraviolet or visible radiation, said luminescence having two distinct visible or short wavelength IR spectral components identified as A and B, the ratio of the intensities being determined by the temperature of the luminescent material, the intensity of said component A decreasing with an increase in temperature and the intensity of said component B increasing with an increase in temperature; measuring the ratio of the intensities of said A and B components for each resolvable element of the infrared image focused on said film; and processing and displaying an image corresponding to the ratio distribution of the luminescent intensities.

4,061,579

INTUMESCENT COATINGS CONTAINING 4,4'-DINITROSULFANILIDE

Paul M. Sawko, and Salvatore R. Riccitiello, both of San Jose, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 22, 1976, Ser. No. 734,902
Int. Cl.[2] C09D *5/18*; C09K *3/28*
U.S. Cl. 252—8.1 10 Claims



1. An intumescent composition, which comprises:
a mixture of 4,4'-dinitrosulfanilide as the intumescent agent in a polymeric binder mixture of a chlorinated polyolefin, a bisphenol A epoxy resin and a rubber-like amine hardener.

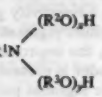
4,061,580

THICKENED AQUEOUS COMPOSITIONS FOR WELL TREATMENT

Richard William Jahnke, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Filed Sept. 8, 1976, Ser. No. 721,638
Int. Cl.[2] E21B *43/27*, *43/26*
U.S. Cl. 252—8.55 R 10 Claims

1. A thickened composition comprising a major amount of hydrochloric aqueous solution of an acid or a salt useful in well treatment and a minor thickening amount of a phosphate salt of at least one alkoxylated amine of the formula



wherein R^1 is an alkyl or alkenyl radical having about 14–30 carbon atoms, each of R^2 and R^3 is an ethylene radical, and each of x and y is an integer of at least 1, the total of x and y being 6 or less.

4,061,581

TRIMETHYLOLPROPANE ESTERS USEFUL AS BASE LUBRICANTS FOR MOTOR OILS

Gérard Leleu, Grenoble; Pierre Bédague, Biviers, and Bernard Sillion, Grenoble, all of France, assignors to Institut Francais du Petrole and Rhone Progil, both of Rueil Malmaison, France

Filed Dec. 12, 1974, Ser. No. 532,237
Claims priority, application France, Dec. 12, 1973, 73.44459
Int. Cl.[2] C10M *1/48*
U.S. Cl. 252—32.7 E 25 Claims

1. A trimethylol-propane ester composition useful as lubricant base for motor-car engines, consisting essentially of the product obtained by total esterification of trimethylolpropane by means of a diversity of saturated aliphatic-hydrocarbyl carboxylic acids, said diversity having in a proportion of 6 to 33% of the carboxy equivalents, at least one straight or branched-chain dicarboxylic acid having from 4 to 19 carbon atoms, and in a proportion of 94 to 67% of the carboxy equivalents, a mixture of monocarboxylic acids, wherein said mixture of monocarboxylic acids comprises:

a. from 10 to 70% by mole of at least one branched chain acid having from 15 to 22 carbon atoms and selected from the group consisting of those having one methyl side chain, those having two methyl side chains, those having one ethyl side chain, those having one methyl and one ethyl side chains, and those having two ethyl side chains, and

b. from 90 to 30% by mole of at least one straight chain acid having from 7 to 22 carbon atoms.

12. A trimethylol-propane ester composition useful as lubricant base for motor-car engines, consisting essentially of the product obtained by total esterification of trimethylolpropane by means of a diversity of saturated aliphatic-hydrocarbyl carboxylic acids, said diversity having in a proportion of 6 to 33% of the carboxy equivalents, at least one straight or branched-chain dicarboxylic acid having from 4 to 19 carbon atoms, and in a proportion of 94 to 67% of the carboxy equivalents, a mixture of monocarboxylic acids, said mixture comprising:

a. from 10 to 30% by mole of a branched chain acid containing 15-22 carbon atoms and selected from the group consisting of those having one methyl side chain, those having two methyl side chains, those having one ethyl side chain, those having one methyl and one ethyl side chains, and those having two ethyl side chains, and

b. from 40 to 60% by mole of straight-chain acid containing 7 to 9 carbon atoms and from 20 to 40% by mole of straight chain acid containing 10 to 16 carbon atoms.

4,061,582
RESINOUS PIGMENT TONER AND LIQUID DEVELOPER CONTAINING POLYVINYL ACETATE COATED ON THE PIGMENT

Elias P. Moschovis, and John L. Gilson, both of Morton Grove, Ill., assignors to A. B. Dick Company, Niles, Ill.

Filed Oct. 24, 1975, Ser. No. 625,754
Int. Cl.² G03G *9/08, 9/12;* C08J *3/20*
U.S. Cl. 252—62.1 L **9 Claims**

1. A liquid developer for use in providing an ink receptive, water repellent, oleophilic lithographic image suitable for use in the production of multiple copies by lithographic (offset) technique, wherein the developer is formulated of a liquid organic solvent having a resistivity greater than 10^{10} ohm-cm, a toner formed of oleophilic pigment particles, and a polyvinyl acetate resinous binder, the improvement wherein the polyvinyl acetate resinous binder is present as a coating precipitated onto the surfaces of the pigment particles prior to incorporation in the liquid developer as a toner and which includes in addition a hydrophobic colloidal silica present in the ratio of 1 part by weight of the hydrophobic colloidal silica to 1.5 to 4 parts by weight of the toner formed of the polyvinyl acetate resin precipitated on the pigment particles.

4,061,583
PREPARATION OF TITANATES

Michihiro Murata, and Akihiro Kitao, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation-in-part of Ser. No. 490,264, July 29, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,538
Claims priority, application Japan, Mar. 13, 1974, 49-29321; May 24, 1974, 49-59198
Int. Cl.² C01G *23/00;* C01F *11/00*
U.S. Cl. 252—62.3 BT **10 Claims**

1. A process for the preparation of a titanate which comprises the steps of

a. dissolving a titanium salt and at least one metal salt selected from the group consisting of salts of Ba, Ca, Sr, Zn, Cd and Pb in water to form an aqueous solution containing titanium and metal ions;

b. adding the solution containing titanium and metal ions to an aqueous alkaline solution containing hydrogen peroxide to form a precipitate while maintaining a constant pH therein;

c. recovering the precipitate from the resulting mixture; and

d. heating the precipitate at a temperature not lower than 100° C.

4,061,584
HIGH DIELECTRIC CONSTANT INK FOR THICK FILM CAPACITORS

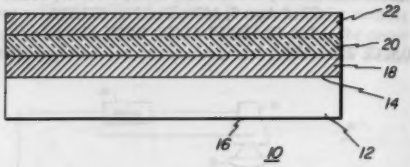
Roland T. Girard, Scotia, and George A. Rice, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 532,454, Dec. 13, 1974, Pat. No. 3,968,412, which is a continuation-in-part of Ser. No. 383,280, July 27, 1973, Pat. No. 3,878,443. This application Jan. 22, 1976, Ser. No. 651,407
The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.
Int. Cl.² H01G *4/12*
U.S. Cl. 252—63 **11 Claims**

1. An improved dielectric ink for thick film printing consisting of:

a powdered, high dielectric constant material which includes a barium titanate material which is one selected from the group consisting of chemically pure barium titanate and chemically pure barium titanate modified with from about 0.125% to about 5.0% by weight of a metal oxide additive;

an alkali-free glass binder comprising from 3 percent to 7 percent by total weight of the dielectric and binder materials, the binder having at least the electropositive element barium present therein, the alkali-free glass has the following formulation:



Ingredient	% by weight
BaO	38 to 46
ZnO	7 to 11
SiO_2	35 to 45
B_2O_3	6 to 8
Al_2O_3	2 to 5

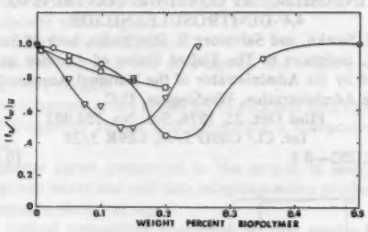
and

a liquid vehicle for said dielectric and binder materials.

4,061,585
METHOD OF USING HETEROPOLYSACCHARIDES PRODUCED BY THE FERMENTATION OF METHANOL

Robert K. Finn; Alex L. Tannahill, both of Ithaca, N.Y., and Joseph E. Laptewicz, Jr., Groton, Conn., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 592,603, July 2, 1975, Pat. No. 4,016,865, which is a division of Ser. No. 523,559, Nov. 14, 1974, Pat. No. 3,932,218, which is a division of Ser. No. 364,559, May 29, 1973, Pat. No. 3,923,782. This application Dec. 1, 1976, Ser. No. 746,595
Int. Cl.² C11D *3/22;* H01M *4/20;* B01J *13/00*
U.S. Cl. 252—89 R **5 Claims**



5. A method of preventing soil redeposition in detergent formulations, comprising adding to said formulations from about .01 to 0.1 percent by weight of an heteropolysaccharide of bacterial origin having an intrinsic viscosity in the range of about 10 to 20 deciliters per gram and comprising the following constituents on a weight percent basis:

1. Organic matter of 60% to 90% comprising
   a. 10% to 30% glucose;
   b. 3% to 15% mannose;
   c. 3% to 15% galactose; and
   d. 5% to 35% pyruvic acid;
2. Inorganic matter of 10% to 40% comprising
   a. 5% to 25% phosphates; and
   b. 5% to 25% cations.

4,061,586

OLEFIN SULFONATE DETERGENT COMPOSITIONS

Stephen Cajetan Klisch, Somerset, and Charles Andrew Martin, Morris Plains, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 349,111, April 9, 1973, abandoned. This application July 23, 1975, Ser. No. 598,378

The portion of the term of this patent subsequent to Sept. 7, 1993, has been disclaimed.

Int. Cl.[2] C11D *1/14, 1/83, 3/34, 17/08*

U.S. Cl. 252—153 6 Claims

1. A light duty, liquid detergent consisting essentially of 10 to 35% by weight of at least one water-soluble salt of a sulfonate alpha olefin containing about 12 to 18 carbon atoms, about 7.5 to about 10% by weight of an alkanoic acid diethanolamide having 12 to 14 carbon atoms in its alkanoyl radical, the weight ratio of olefin sulfonate to said diethanolamide being from about 3:1 to about 1:1, and an aqueous medium selected from the group consisting of water and a mixture of water with a solubilizer selected from the group consisting of 1 to 10% by weight of a C_2–C_3 monohydric alcohol, 0.5 to 10% by weight of a sodium potassium, ammonium or mono-, di- or triethanolammonium salt of C_1–C_3 alkylbenzene sulfonate or C_3–C_6 alkyl sulfate, and mixtures thereof, about 1 to about 8% by weight of a water-soluble salt of allyl sulfonic acid as an anti-gelling agent, said composition containing less than 5% of the total detergent weight of additional compatible noncationic detergents.

4,061,587

LIQUID CRYSTALLINE CINNAMIC ACID ESTERS

Hanspeter Scherrer, Therwil, and Arthur Boller, Binningen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

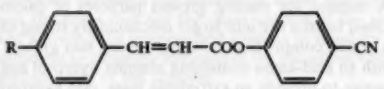
Continuation of Ser. No. 604,573, Aug. 14, 1975, abandoned, which is a division of Ser. No. 529,436, Dec. 4, 1974, Pat. No. 3,927,066. This application July 8, 1976, Ser. No. 703,489

Claims priority, application Switzerland, Dec. 17, 1973, 17626/73

Int. Cl.[2] C09K *3/34;* G02F *1/13*

U.S. Cl. 252—299 21 Claims

2. A nematic composition for electro-optical purposes, which comprises a compound of the formula



wherein R is straight-chain alkyl of 1 to 8 carbon atoms, or mixtures thereof, and one or more other positive anisotropic nematic compounds.

4,061,588

CATALYST COMPOSITION AND METHOD OF PREPARATION

Michael Gulla, Sherborn, Mass., assignor to Shipley Company Inc., Newton, Mass.

Filed Sept. 30, 1975, Ser. No. 618,034

The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.

Int. Cl.[2] B01J *31/30*

U.S. Cl. 252—429 R 59 Claims

1. An essentially dry composition which, upon admixture with an aqueous acid solution having a pH of less than the precipitation point of the catalyst, forms a stable catalyst composition for catalyzing a substrate prior to the deposition of an electroless metal, said solution containing sufficient halide ions to render the same stable and catalytic, said halide ions being derived from said aqueous acid with which said dry composition is mixed, said dry composition or the combination resulting from mixing said aqueous acid with said dry composition, said essentially dry compositions comprising a catalytic metal in combination with tin compounds where at least a portion of said tin compounds is in stannous form in an amount whereby the molar ratio of stannous tin to catalytic metal is at least 2:1, and a member selected from the group of urea in an amount of at least one mole per ten moles of acid with which said dry composition is mixed, an extraneous halide salt in an amount of at least 0.2 moles in excess of that provided by all catalyst components including the acid with which the dry composition is mixed and mixtures thereof.

4,061,589

CORROSION INHIBITOR FOR COOLING WATER SYSTEMS

Jose T. Jacob, Waukegan, Ill., assignor to Chemed Corporation, Cincinnati, Ohio

Filed Jan. 17, 1977, Ser. No. 759,361

Int. Cl.[2] C09K *3/00*

U.S. Cl. 252—389 A 13 Claims

1. The method of inhibiting metal corrosion in aqueous systems that comprises adding to the aqueous liquid an effective amount, 1 –10,000 ppm. of a member selected from the group consisting of 1,3,5-triazine-4,6-diketo-2-dithio ammonium phosphamate and 1,3,5- triazine-4-6-dithio-2-dithio ammonium phosphamate.

4,061,590

CATALYST COMPOSITION OF AN AZO NITRILE MIXTURE IN AN ORGANIC SOLVENT

Earl P. Moore, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 484,309, June 28, 1974, Pat. No. 3,987,025. This application May 17, 1976, Ser. No. 687,178

Int. Cl.[2] B01J *27/24, 31/02;* C07C *107/02*

U.S. Cl. 252—426 8 Claims

1. A catalyst composition with a concentration of from 10 to 85% by weight of an azonitrile mixture having a freezing point of a maximum of 25° C selected from the group consisting of:

A. 2,2′-azobis(2methylbutyronitrile), 2,2′-azobis(2-methylhexanenitrile) and 2-[(1-cyano-1-methylpropyl)azo]-2-methylhexanenitrile;

B. 2,2-azobis(2-methylbutyronitrile), 2,2′-azobis(2-methylheptanenitrile) and 2-[(1-cyano-1-methylpropyl)azo]-2-methylheptanenitrile;

C. 2,2′-azobis(2-methylbutyronitrile), 2,2′-azobis(2-ethylhexanenitrile) and 2-[(1-cyano-1-methylpropyl)azo]-2-ethylhexanenitrile;

D. 2,2′-azobis(2-methylbutyronitrile), 2,2′-azobis(2-ethylheptanenitrile) and 2-[(1-cyano-1-methylpropyl)azo]-2-ethylheptanenitrile;

E. 2,2′-azobis(2-methylbutyronitrile), 2,2′-azobis(2-methyloctanenitrile) and 2-[(1-cyano-1-methylpropyl-)azo]-2-methyloctanenitrile;

F. 2,2′-azobis(2-methylpentanenitrile, 2,2′-azobis(2-ethylhexanenitrile) and 2-[(1-cyano-1-methylbutyl)azo]-2-ethylhexanenitrile;

G. 2,2′-azobis(2-methylhexanenitrile), 2,2′-azobis(2-methyloctanenitrile) and 2-[(1-cyano-1-methylpentyl-)azo]-2-methyloctanenitrile;

H. 2,2′-azobis(2-methylpentanenitrile), 2,2′-azobis(2-ethylheptanenitrile) and 2-[(1-cyano-1-methylbutyl)azo]-2-ethylheptanenitrile;

I. 2,2′-azobis(2-methylhexanenitrile), 2,2′-azobis(2-methylheptanenitrile) and 2-[(1-cyano-1-methylpentyl)azo]-2-methylheptanenitrile;

J. 2,2′-azobis(2-methylpentanenitrile), 2,2′-azobis(2-methyloctanenitrile) and 2-[(1-cyano-1-methylbutyl)-azo]-2-methyloctanenitrile;

K. 2,2′-azobis(2-methylpentanenitrile), 2,2′-azobis(2-methylhexanenitrile) and 2-[(1-cyano-1-methylbutyl)azo]-2-methylhexanenitrile;

L. 2,2′-azobis(2-methylpentanenitrile), 2,2′-azobis(2-methyl-

heptanenitrile) and 2-[(1-cyano-1-methylbutyl)azo]-2-methylheptanenitrile; and

M. 2,2'-azobis(2-methylhexanenitrile), 2,2'-azobis(2-ethylheptanenitrile) and 2-[(1-cyano-1-methylpentyl)azo]-2-ethylheptanenitrile in an organic solvent inert to the azonitrile.

4,061,591

SELECTIVE ADSORBENT FOR USE IN AFFINITY CHROMATOGRAPHY

Roy Oliver, Rockford, Ill., and Garfield P. Royer, Worthington, Ohio, assignors to Pierce Chemical Company, Rockford, Ill.

Continuation of Ser. No. 507,197, Sept. 18, 1974, abandoned. This application July 6, 1976, Ser. No. 702,432

Int. Cl.² B01J *31/02*

U.S. Cl. 252—430 **5 Claims**

1. A selective adsorbent for use in affinity chromatography comprising, as one part, a water-soluble covalently bonded complex of an affinity ligand and a biospecific handle and, as the other part, an insoluble matrix or solid support which has covalently immobilized on its surface an adsorbent which has specific affinity for the biospecific handle of the complex, the biospecific handle and the absorbent being polynucleotides or 2' deoxy derivatives thereof, the polynucleotide of said handle having a base which is complementary, as to spatial arrangement and affinitive interaction, with the base of the polynucleotide adsorbent.

4,061,592

HYDROCARBON CONVERSION CATALYST

Waldeen C. Buss, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 233,236, March 9, 1972, Pat. No. 3,951,782, which is a continuation-in-part of Ser. No. 200,121, Nov. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 132,715, April 9, 1971, abandoned. This application Dec. 12, 1975, Ser. No. 640,366

Int. Cl.² B01J *27/04, 27/08, 27/10, 23/64*

U.S. Cl. 252—439 **2 Claims**

1. In a hydrocarbon hydroconversion catalyst composition including, on a porous carrier, 0.01 to 5 weight percent of a platinum component selected from the group consisting of platinum metal, platinum oxide, platinum sulfide or platinum halide, or mixtures thereof, 0.01 to 3 percent of a rhenium component selected from the group consisting of rhenium as an aqueous solution of perrhenic acid or ammonium perrhenate, or mixtures thereof, calcining and thereafter heating the catalyst composition in dry hydrogen, and a zinc component taken from the group consisting of zinc metal, zinc oxide, zinc sulfide or mixtures thereof, the improvement comprising, including 0.01 to 0.2 weight percent of said zinc component, calculated as the metal, in said composition.

4,061,593

STABILIZATION OF CALCIUM OXIDE SULFATE TRAPPING MATERIALS

Jack C. Summers, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 26, 1977, Ser. No. 762,676

Int. Cl.² B01J *27/20, 29/00*

U.S. Cl. 252—443 **3 Claims**

1. A method of making durable absorbent pellets suitable for use in fixed volume scrubber vessels for removing sulfur oxides and sulfates from the combustion gases of sulfur containing hydrocarbon fuels comprising the steps of

making calcined pellets comprising a sodium silicate binder and an absorbent taken from the group consisting of calcium oxide and calcium hydroxide, the binder making up at least 10% by weight of said pellets, and

reacting said pellets with carbon dioxide gas at a temperature in the range from about 200° to 600° C. to convert at least about one third of the calcium therein to calcium carbonate, the resulting calcium containing pellets being effective and durable absorbents when used in said fixed volume scrubber vessels.

4,061,594

ALUMINA-BASED BODIES OBTAINED BY AGGLOMERATION WHICH ARE RESISTANT TO ELEVATED TEMPERATURES

Max Michel, Yerres, and Regis Poisson, La Rochelle, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 539,847, Jan. 9, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 750,222

Claims priority, application France, Jan. 10, 1974, 74.00803; Nov. 18, 1974, 74.37892

Int. Cl.² B01J *23/10, 23/08*

U.S. Cl. 252—462 **14 Claims**

1. Alumina-based substances stabilized to a calcination temperature of approximately 1200° C, prepared by autoclaving alumina and 1 to 15% by weight of at least one additive selected from the group consisting of the oxides of lanthanum, neodymium, praseodymium and thorium, and calcining the resulting blend, with said alumina having been produced by partial dehydration of hydrargillite or an alumina gel to produce activated alumina and then autoclaving the activated alumina to form said alumina.

14. Alumina-based substances stabilized to calcination temperatures up to 1200° C prepared by combining (1) alumina produced by partial dehydration of hydrargillite or an alumina gel followed by autoclaving to produce the alumina, and (2) from 1 to 15% by weight of at least one additive selected from the group consisting of the oxides of lanthanum, neodymium, praseodymium and thorium, autoclaving the combination of alumina and additive and calcining the combination at a temperature up to 1200° C.

4,061,595

PRODUCTION OF SULFUR RECOVERY CATALYST FROM BAUXITE FINES

Robert A. Burns, Long Valley, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Mar. 15, 1976, Ser. No. 666,795

Int. Cl.² B01J *23/08*

U.S. Cl. 252—463 **6 Claims**

1. A method for making ground particles of calcined or uncalcined bauxite ore into larger mechanically strong catalyst pellets which comprises thoroughly mixing said ground particles with an acid-anion containing alumina hydrosol and sufficient water to provide an extrudable mass, said hydrosol having an aluminum/acid-anion ratio in the range of about 0.5 to 2:1 when using calcined ore and in the range of about 0.5 to 1.5:1 when using uncalcined ore, said hydrosol being used in amount of 130 to 200 pounds, on an anhydrous weight basis, per ton of pellets, anhydrous weight basis, extruding said mass into pellets, and drying and calcining said pellets.

4,061,596

PROCESS FOR PREPARING TITANIUM OXIDE SHAPED CARRIER

Kunichi Matsushita, Yokohama; Hikaru Sakurada, Yokkaichi, and Kazuhiko Onuma, Machida, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Dec. 2, 1975, Ser. No. 636,983

Claims priority, application Japan, Dec. 2, 1974, 49-137937; Dec. 6, 1974, 49-140222; Dec. 6, 1974, 49-140223; July 14, 1975, 50-86087; July 31, 1975, 50-93466

Int. Cl.² B01J *21/00;* **C04B** *35/46, 35/64*

U.S. Cl. 252—463 **16 Claims**

1. A process for preparing a shaped titanium oxide catalyst carrier which comprises calcining titanium oxide at 400° C - 800° C then adding to said calcined titanium oxide a mineral acid or carboxylic acid and alumina or a precursor of alumina selected from the group consisting of aluminum hydroxide,

alimina sols and aluminum salts, shaping the mixture and then calcining the shaped material at 300° C - 800° C.

4,061,597

NO_x CONTROL IN CATALYST MANUFACTURE

Marvin Sherwood Goldstein, Norwalk; John Francis Lindsley, Stamford, both of Conn.; William Woodrow Allison, and Charles Dan Price, both of Fort Worth, Tex., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 4, 1975, Ser. No. 637,570
Int. Cl.² B01J *23/16, 21/04, 23/84;* C01B *21/00*
U.S. Cl. 252—465 10 Claims

1. A process for abating oxides of nitrogen which arise during heat treatment in the manufacture of catalysts containing a source of said oxides which process comprises introducing the catalyst material requiring heat treatment at a temperature of 300° C. and higher in said manufacture into a suitable heat treatment zone, separately introducing an effective amount of urea into said heat treatment zone, and thereafter effecting heat treatment at a temperature of 300° C. and higher whereby oxides of nitrogen arising from said catalyst material are abated by reaction with the separately introduced urea.

9. The process of claim 1 wherein said catalyst material is one based on an alumina support.

4,061,598

CATALYST FOR HYDROGENATING ANTHRAQUINONES

Kamel Michel Makar, Memphis, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 25, 1976, Ser. No. 699,933
Int. Cl.² B01J *21/04, 23/44, 23/58*
U.S. Cl. 252—466 PT 13 Claims

1. A method for making catalysts which are useful for the hydrogenation of anthraquinones comprising the sequential steps of

a. impregnating dry activated alumina particles with 2-20 parts by weight of alkali metal carbonate or alkaline earth metal carbonate and 0.1-10 parts by weight of a basic palladium salt, said parts by weight being based on 100 parts by weight of dry activated alumina prior to impregnation, by admixing the alumina with finely divided particles of the palladium salt and an aqueous solution of the carbonate in which the amount of water is sufficient to wet the pores, but not the outer surface of the alumina, and allowing the impregnated alumina to stand for a time sufficient to complete diffusion of the palladium within the wetted pores of the catalyst;

b. reducing the palladium by dispersing the impregnated alumina in a dilute aqueous solution of reducing agent, the amount of reducing agent being sufficient to reduce substantially all the palladium to a zero valence state;

c. separating the reduced catalyst from the solution of reducing agent, washing it with water and then removing substantially all the water therefrom while maintaining the catalyst at a temperature below about 100° C; and

d. heating the dewatered catalyst in an oxidizing atmosphere for a period of at least about 1 hour at a temperature of 400°-650° C.

4,061,599

COMPOSITION FOR PREPARATION OF A PHOTOCONDUCTOR SURFACE FOR USE IN ELECTROPHOTOGRAPHY

Guy Anthony Marlor, 816 Dixon Way, Los Altos, Calif. 94022

Filed Feb. 6, 1976, Ser. No. 655,819
Int. Cl.² G03G *5/085*
U.S. Cl. 252—501 22 Claims

1. An enamel slip devoid of natural and synthetic resins for use in the preparation of a photoconductive surface wherein the slip is sprayed upon the surface, said enamel slip comprising a mixture of:

solids comprising a photoconductive powder and a glass powder, both powders having an average particle size below ten microns;

a carrier vehicle comprising a plurality of organic solvents, at least one of said plurality of organic solvents being selected to enhance atomization of the slip during spraying and at least one of said plurality of organic solvents being selected as a physical suspension element for the solids; and

particulate solid means for suspending the solids in the carrier vehicle by physical dispersion, the particulate solid means for suspending being substantially chemically and electrically nonreactive with the solids.

4,061,600

GRAPHITE ELECTRODE AND METHOD OF MAKING

Arthur William Moore, North Olmsted; Herbert Franz Volk, Parma, both of Ohio, and Jack Kenneth Merrow, Seattle, Wash., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 478,590, June 12, 1974, abandoned. This application May 11, 1976, Ser. No. 685,140
Int. Cl.² H01B *1/06*
U.S. Cl. 252—510 28 Claims

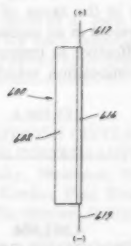
1. In the process of producing graphitized articles of a quality suitable for use as graphite electrodes by forming, baking and graphitizing a mixture of coke filler and binder, an improvement resulting in articles of improved flexural strength which comprises heating at least a portion of said coke filler in the absence of air at a temperature between about 1600° C and about 2200° C for a period of at least 0.1 hour prior to mixing said particles with said binder.

4,061,601

ELECTRICALLY CONDUCTIVE REAR VIEW MIRROR

Jerome Francis Clary; Robert Emerson Wiley, and Richard Earl Bowns, all of Port Huron, Mich., assignors to Acheson Industries, Inc., Port Huron, Mich.

Division of Ser. No. 364,749, May 29, 1973, Pat. No. 3,948,811. This application Feb. 9, 1976, Ser. No. 656,122
Int. Cl.² H01B *1/06*
U.S. Cl. 252—511 7 Claims



1. An electrically conductive rear view mirror having a substrate with an electrically conductive coating composition thereon,

said composition comprising in weight percent,

about 5% to about 90% of a heat stable fluoroelastomer polymer about 10% to about 95% of conductive particles, said conductive particles are a finely particulated material selected from at least one material from the group consisting of silver, copper, noble metals and alloys thereof, graphite, or conductive carbon, said composition being for the purpose of heating the mirror.

4,061,602

CONDITIONING SHAMPOO COMPOSITION CONTAINING A CATIONIC DERIVATIVE OF A NATURAL GUM (SUCH AS GUAR) AS THE ACTIVE CONDITIONING INGREDIENT

Helen Elizabeth Oberstar, Montville, and Morton Alan Westman, Fort Lee, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 3, 1976, Ser. No. 711,331
Int. Cl.[2] A61K *7/08;* C11D *1/88, 1/94, 3/37*
U.S. Cl. 252—547 5 Claims

1. A shampoo-creme rinse composition consisting essentially of about 5 to 20 weight percent of at least one amphoteric detergent, about 5 to 20 weight percent of at least one anionic detergent and from about 0.1 to 5 weight percent of 3-(trimethylamino)-2-hydroxypropyl guar chloride salt.

4,061,603

DETERGENTS

Joseph Rubinfeld, Northport, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 446,228, Feb. 27, 1974, Pat. No. 3,980,588, Continuation of Ser. No. 231,367, March 2, 1972, abandoned, which is a division of Ser. No. 56,123, July 2, 1970, abandoned, which is a continuation of Ser. No. 553,622, May 31, 1966, abandoned. This application June 25, 1976, Ser. No. 699,774
The portion of the term of this patent subsequent to Sept. 14, 1993, has been disclaimed.
Int. Cl.[2] C11D *3/07*
U.S. Cl. 252—548 4 Claims

1. A detergent mixture suitable for use in aqueous liquid detergent compositions consisting essentially of (a) a water-soluble, anionically active olefin sulfonate product having 12 to 21 carbon atoms in the olefin molecular structure, (b) a water-soluble higher alkyl poly (ethenoxy) ether sulfate having 10 to 20 carbon atoms in the higher alkyl group and 1 to 5 ethenoxy groups per molecule, said olefin sulfonate product and said ether sulfate being in the form of a salt selected from the group consisting of sodium, potassium, ammonium and ethanolammonium and (c) a higher fatty acid alkanolamide selected from the group consisting of fatty acid isopropanolamides and fatty acid monoethanolamides in which the higher fatty acyl radical has 10 to 14 carbon atoms, the weight ratio of said sulfate to said sulfonate being in the range of 90:10 to 30:70, said alkanolamide being present in an amount of about ½ to 10% by weight and being effective to improve the foam stability as compared with a composition which does not contain said alkanolamide.

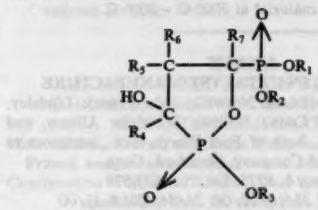
4,061,604

FLAMEPROOFING OF PLASTICS

Rudolf Kirchmayr, Aesch, and Hugo Illy, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 15, 1975, Ser. No. 640,992
Claims priority, application Switzerland, Dec. 18, 1974, 16895/74; Nov. 11, 1975, 14565/75
Int. Cl.[2] C07F *9/28;* C08K *5/53*
U.S. Cl. 260—2.5 AJ 11 Claims

1. A flameproofed composition comprising a polymer selected from the group consisting of a polyurethane and an epoxide resin and from 2 to 30 percent by weight of the polymer of a compound of the formula I



(I)

wherein
R_1 and R_2 each independently represent alkyl having 1 – 4 carbon atoms, cyclohexyl, aralkyl having 7 or 8 carbon atoms, alkoxyalkyl having 3–6 carbon atoms, halogenoalkyl having 2–3 carbon atoms, or alkenyl having 3–5 carbon atoms, R_3 is identical to R_1 or R_2, R_4 is alkyl having 1–4 carbon atoms, or phenyl, R_5 and R_6 each independently represent hydrogen or alkyl having 1–4 carbon atoms, and R_7 represents hydrogen, alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, or phenyl.

4,061,605

REACTION PRODUCTS OF BENZENEPHOSPHONIC ACID AND MELAMINE AS FLAME-RETARDANT ADDITIVES

Eli Simon, 7175 Little Harbor Drive, Huntington Beach, Calif. 92648

Filed Mar. 3, 1976, Ser. No. 663,446
Int. Cl.[2] C08G *18/14*
U.S. Cl. 260—2.5 AJ 3 Claims

1. Addition-product salts of benzenephosphonic acid and melamine as flame-retardants, wherein the mol percentage of benzenephosphonic acid is within the range of 33⅓ to 66⅔ mol% and preferably within the range of 33⅓ to 40 mol%.

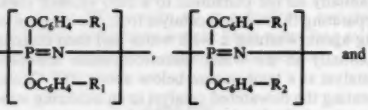
4,061,606

POLYPHOSPHAZENE POLYMER/ORGANIC POLYMER FOAMS

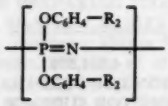
Ronald Lee Dieck, and Edwin John Quinn, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 27, 1976, Ser. No. 754,608
Int. Cl.[2] C08J *9/10*
U.S. Cl. 260—2.5 R 8 Claims

1. A foamed blend comprising:
A. a polyphosphazene comprising randomly distributed repeating units represented by the formulas:



and



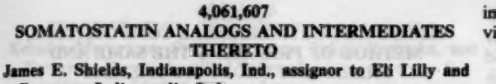
wherein R_1 and R_2 are the same or different and are hydrogen, a C_1 – C_{10} linear or branched alkyl radical, or a C_1 – C_4 linear or branched alkoxy radical subtituted on any sterically permissible position on the phenoxy group,
B. a foamable compatible organic polymer,
C. said polymer (A) being present in an amount of about 15% to about 85% by weight and said polymer (B) being present in an amount of about 85% to about 15% by weight based on the combination of (A) and (B).

4,061,607
SOMATOSTATIN ANALOGS AND INTERMEDIATES THERETO

James E. Shields, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed July 28, 1976, Ser. No. 709,465
Int. Cl.[2] C08L 67/00; C07C 103/52
U.S. Cl. 260—8 28 Claims

1. A compound selected from those of the formula



and their pharmaceutically acceptable non-toxic acid addition salts, and R-L-Ala-Gly-L-Cys(R_1)-L-Lys(R_2)-L-Asn-L-Phe-L-Phe-L-Trp(R_5)-L-Lys(R_2)-L-Thr(R_3)-Y-L-Thr(R_3)-L-Ser(R_4)-L-Cys(R_1)-X; in which

Y is D-Phe, L-Cha, or L-Leu;

R is hydrogen or an α-amino protecting group;

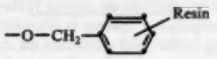
R_1 is hydrogen or a thio protecting group;

R_2 is hydrogen or an E-amino protecting group;

R_3 and R_4 each are hydrogen or a hydroxy protecting group;

R_5 is hydrogen or formyl; and

X is hydroxy or



in which the resin is polystyrene; with the proviso that, when X is hydroxy, each of R, R_1, R_2, R_3, R_4, and R_5 is hydrogen, and, when X is

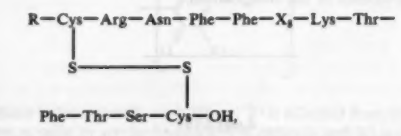
each of R, R_1, R_2, R_3, and R_4 is other than hydrogen.

4,061,608
ARG [4]-SOMATOSTATIN AND ANALOGUES THEREOF

Dimitrois Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed July 13, 1976, Ser. No. 705,721
Int. Cl.[2] C08L 67/00; C07C 103/52
U.S. Cl. 260—8 9 Claims

1. A polypeptide of the formula:



its linear precursor or a non-toxic acid addition salt thereof, in which

R is hydrogen or Ala-Gly-

and

X_8 is L-Trp or D-Trp.

4,061,609
INHIBITOR FOR PLATINUM CATALYZED SILICONE RUBBER COMPOSITIONS

William J. Bobear, Latham, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Apr. 9, 1976, Ser. No. 675,377
Int. Cl.[2] C08L 1/00
U.S. Cl. 260—9 34 Claims

1. A platinum catalyzed silicone rubber composition with an improved work life comprising (a) 100 parts by weight of a vinyl-containing base linear polysiloxane of the formula,

$$R_a SiO_{4-a/2}$$

and blends of such polysiloxanes, where R is selected from the class consisting of alkyl radicals of 1 to 8 carbon atoms, vinyl radicals, phenyl radicals, fluoroalkyl radicals of 3 to 10 carbon atoms and mixtures thereof, where the vinyl radical unsaturation in said polymer is at least 0.005 mole percent, a varies from 1.98 to 2.01, (b) at least 0.1 parts per million of platinum, (c) from 1 to 50 parts by weight of a hydrogen-containing polysiloxane, and (d) at least 0.007 parts by weight of an inhibitor compound having at least one radical of the formula, — C — O — O — H, per 100 parts of said vinyl-containing polymer.

10. The composition of claim 1 wherein there is present per 100 parts of (a) from 5 to 150 parts of a filler selected from the class consisting of titanium oxide, lithopone, zinc oxide, zirconium silicate, silica aerogel, iron oxide, diatomaceous earth, calcium carbonate, fumed silica, cyclicpolysiloxane treated silica, silazane treated silica, precipitated silica, glass fibers, magnesium oxide, chromic oxide, zirconium oxide, alpha quartz, calcined clay, asbestos, carbon, graphite, cork, cotton and synthetic fibers.

4,061,610
COATING COMPOSITIONS CONTAINING STARCH HALF-ESTERS AND PROCESS FOR PREPARING SAME

Raymond Charles Glowaky, Matteson; Stephen Edward Rudolph, Glenwood, and Gordon Paul Bierwagen, Homewood, all of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed May 19, 1976, Ser. No. 687,587
Int. Cl.[2] C08L 3/06
U.S. Cl. 260—17.4 ST 25 Claims

1. An aqueous coating composition which comprises an aqueous dispersion of about 25 to 95 parts by volume of a polymeric resin binder, 5 to 75 parts by volume of pigment and dispersing amounts of a dispersant consisting of half-esters of starch having pendant carboxylic acid groups and an average degree of substitution ranging from 0.25 to 3.0 wherein at least 10 mole percent of said pendant carboxylic acid groups are neutralized; said half-esters of starch derived from

a. low molecular weight hydrolyzed starch having a plurality of anhydroglucose units and an average molecular weight ranging up to about 100,000 or a derivative of said hydrolyzed starch having a degree of substitution below about 0.1 and

b. at least about 0.25 mole of at least one anhydride of a polycarboxylic acid for each anhydroglucose unit of the hydrolyzed starch or of said hydrolyzed starch derivative.

4,061,611
AQUEOUS COMPOSITIONS CONTAINING STARCH ESTER DISPERSANTS

Raymond Charles Glowaky, Matteson; Stephen Edward Rudolph, Glenwood, and Gordon Paul Bierwagen, Homewood, all of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Sept. 22, 1976, Ser. No. 725,604
Int. Cl.[2] C08L 3/06
U.S. Cl. 260—17.4 ST 22 Claims

1. A coating composition comprising an aqueous dispersion of from about 25 to 95 parts by volume of a polymeric resin binder, 5 to 75 parts by volume of pigment and a dispersing amount of dispersant consisting of mixed esters of starch characterized as having an average degree of substitution ranging from 0.5 to 3.0 wherein at least about 0.1 of total degree of substitution consists of ester groups having pendant carboxylic acid groups and at least about 10 mole percent of said pendant carboxylic acid groups are neutralized; said mixed esters of starch derived from

a. low molecular weight hydrolyzed starch having a plurality of anhydroglucose units with average molecular weights ranging up to about 100,000 or a derivative of said hydrolyzed starch having a degree of substitution below about 0.1 and

b. at least about 0.5 mole of acylating agent for each anhydroglucose unit of the hydrolyzed starch or the derivative thereof;

said acylating agent consisting of (i) from about 0.1 to 2.9 moles of at least one anhydride of a polycarboxylic acid and (ii) from about 0.1 to 2.9 moles of at least one agent selected from the class consisting of anhydrides of monocarboxylic acids and the acyl halides of monocarboxylic acids.

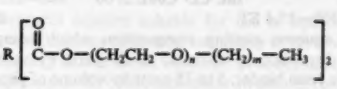
4,061,612

LOW TEMPERATURE PLASTICIZERS FOR SPECIALTY RUBBERS CONSISTING OF DIESTERS OF DICARBOXYLIC ACIDS WITH HEXYLOXYETHOXYETHANOL OR BUTOXYETHOXYETHOXYETHANOL

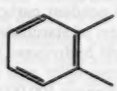
Eugene R. Bertozzi, Yardley, Pa.; Robert F. Hoffman, Delran, and Robert Barclay, Trenton, both of N.J., assignors to Thiokol Corporation, Newtown, Pa.

Filed July 6, 1976, Ser. No. 702,826
Int. Cl.[2] C08K *5/11, 5/12;* C07C *69/34*
U.S. Cl. 260—31.4 R **17 Claims**

1. A composition of matter of the formula:



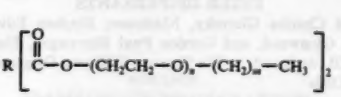
wherein R is $-(CH_2)_3-$, $-(CH_2)_4-$,



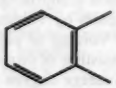
a mixture of $-(CH_2)_3-$ and $-(CH_2)_4-$, or a mixture of $-(CH_2)_2-$, $-(CH_2)_3-$, and $-(CH_2)_4-$; and n and m are 3, or n is 2 and m is 5.

16. An elastomeric composition having solvent resistance, high temperature stability, and extended low temperature properties which comprises:

a. An effective amount of a composition of matter of the formula:



wherein R is $-(CH_2)_3-$, $-(CH_2)_4-$,



a mixture of $-(CH_2)_3-$ and $-(CH_2)_4-$, or a mixture of $-(CH_2)_2-$, $-(CH_2)_3-$, and $-(CH_2)_4-$; and n and m are 3, or n is 2 and m is 5; and

b. a specialty rubber.

4,061,613

SEMISOLID POLYMERIZABLE COMPOSITIONS, METHOD OF PREPARING THE SAME AND THERMOSET PRODUCTS THEREOF

James M. Self, Pittsburgh, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 597,673, June 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 544,966, Jan. 29, 1975, Pat. No. 4,011,195, which is a continuation-in-part of Ser. No. 460,489, April 12, 1974, abandoned. This application Feb. 4, 1976, Ser. No. 655,012
Int. Cl.[2] C08K *3/34*
U.S. Cl. 260—40 R **12 Claims**

1. A semisolid polymerizable composition comprisng the unpolymerized reaction product of:

a. One part by weight of unsaturated polyester resin syrup;

b. 0.1–2.0 parts by weight of aqueous sodium silicate containing 45 to 85 percent by weight water and having a weight ratio SiO_2/Na_2O from 1.5 to 3.75;

c. 0.1–2.0 parts by weight of calcium sulfate hemihydrate; the amount of said calcium sulfate hemihydrate being sufficient to combine with at least 85 percent by weight of the uncombined water which is contained in the other ingredients of the composition.

4,061,614

SEMISOLID POLYMERIZABLE COMPOSITIONS, METHOD OF PREPARING THE SAME AND THERMOSET PRODUCTS THEREOF

James M. Self, Pittsburgh, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 480,169, June 17, 1974, Pat. No. 3,978,018. This application Mar. 16, 1976, Ser. No. 667,519
Int. Cl.[2] C08K *3/34*
U.S. Cl. 260—40 R **12 Claims**

1. A semisolid polymerizable composition comprising the unpolymerized reaction product of:

a. One part by weight of unsaturated polyester resin syrup;

b. 0.1–1.5 parts by weight of aqueous alkali-stabilized colloidal silica containing from 10 to 50 percent by weight solids, balance water; and

c. 0.2–4.0 parts by weight of calcium sulfate hemihydrate; the amount of said calcium sulfate hemihydrate being sufficient to combine with at least 85 percent by weight of the uncombined water which is contained in the other ingredients of the composition.

4,061,615

SHAPED POLYESTER ARTICLES HAVING GOOD FLAME RESISTANCE AND PROCESS FOR THE PRODUCTION THEREOF

Paul Couchoud, Dardilly, France, assignor to Rhone-Poulenc-Textile, France

Filed Dec. 22, 1975, Ser. No. 642,904
Claims priority, application France, Dec. 26, 1974, 74.43220
Int. Cl.[2] C08G *51/62*
U.S. Cl. 260—45.7 P **7 Claims**

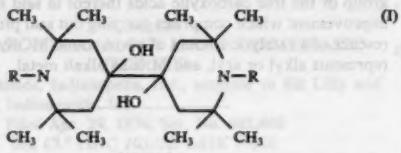
1. Shaped articles of polyester of good resistance to flame comprising a polymethylene copolyester containing 60–95 mol % of terephthalate units and 5 to 40 mol % of isophthalate units and containing a fireproofing effective amount of 1,3-bis(-diphenylphosphinoxide) 2,2 di(bromomethyl)propane or hydroquinone polyphenylphosphonate or monobromohydroquinone polyphenylphosphonate.

4,061,616
STABILIZATION OF SYNTHETIC POLYMERS

Keisuke Murayama; Syoji Morimura; Takao Yoshioka, and Tomoyuki Kurumada, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation of Ser. No. 472,370, May 22, 1974, abandoned.
This application Sept. 4, 1975, Ser. No. 610,334
Claims priority, application Japan, June 15, 1973, 48-68144
Int. Cl.² C08K 5/34
U.S. Cl. 260—45.8 N 8 Claims

1. A synthetic polymer composition stabilized against photo- and thermal deterioration wherein there is incorporated, in a sufficient amount to prevent said deterioration, a compound having the formula



(I)

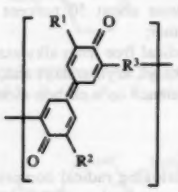
wherein R and R', which may be the same or different, and each represents hydrogen atom, an alkyl group, an alkenyl group, an alkynyl group, an aralkyl group, a hydroxyalkyl group, an alkoxyalkyl group, an aliphatic or aromatic acyloxyalkyl group, a cyanoalkyl group, a halogenoalkyl group, an epoxyalkyl group, an alkoxycarbonylalkyl group, an aliphatic acyl group, an alkoxycarbonyl group or an aralkoxycarbonyl group, or an acid addition salt thereof.

4,061,617
OXIDATION-REDUCTION DIPHENOQUINONE-DIPHENOHYDROQUINONE POLYMERS

Allan S. Hay, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

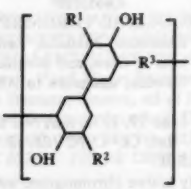
Division of Ser. No. 435,335, Jan. 21, 1974, Pat. No. 3,959,223.
This application Apr. 14, 1976, Ser. No. 676,854
Int. Cl.² C08L 65/02, 71/04; C08F 4/50; C09K 15/00
U.S. Cl. 260—47 R 11 Claims

1. A homopolymer comprising recurring units of the formula:



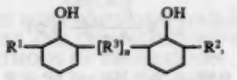
where independently each R^1 and R^2 is selected from monovalent acyclic or cyclic hydrocarbon radicals and R^3 is selected from divalent acyclic or cyclic hydrocarbon radicals.

2. A homopolymer comprising recurring units of the formula:



where independently each R^1 and R^2 is selected from acyclic or cyclic hydrocarbon radicals and R^3 is selected from divalent acyclic or cyclic hydrocarbon radicals.

9. A process for the preparation of claim 1 polymer, which comprises contacting a diphenol monomer reactant having the formula:



where R^1, R^2 and R^3 are as defined hereinbefore, with oxygen in the presence of a tertiary amine-basic cupric salt complex.

4,061,618
PROCESS FOR PREPARING STABLE POLYURETHANE LATICES

Henry Stanley, Cedar Grove, and Dilip K. Ray-Chaudhuri, Somerville, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed May 7, 1975, Ser. No. 575,253
Int. Cl.² C08L 75/08
U.S. Cl. 260—29.2 TN 9 Claims

1. A process for preparing a predominantly linear polyurethane latex comprising the steps:

a. reacting by initially heating an organic polyisocyanate and an organic compound containing at least two reactive hydrogen atoms as determined by the Zerewitinoff method and having a molecular weight of from about 300 to about 20,000, a portion of which is a polyethylene glycol of molecular weight from 600 to 20,000 in proportions such that the ratio of isocyanate groups to reactive hydrogen atoms is in the range of from 0.7 to 1.3, and said polyethylene glycol is present in an amount of from 2 to 12% by weight of polymer solids,

b. terminating the polymerization reaction by addition of a terminating agent thereto when a desired viscosity is reached and thereafter,

c. adding water to the reaction mixture in an amount so as to produce a latex containing from about 20 to 60% solids, by weight.

4,061,619
COPOLYAMIDE DISPERSIONS AND METHODS OF MAKING AND USING SAME

Siegfried Schaaf, Chur, Switzerland, assignor to Inventa AG fur Forschung und Patentverwertung, Zurich, Switzerland

Filed May 15, 1975, Ser. No. 577,866
Claims priority, application Switzerland, May 21, 1974, 6968/74
Int. Cl.² C08L 77/06
U.S. Cl. 260—29.2 N 11 Claims

1. In a copolyamide dispersion comprising copolyamide powder with a grain size of up to 0.1 mm., water and a thixotropy-producing agent, the improvement which comprises the presence of 0.2 to 5.0 percent by weight of at least one fatty alcohol based on the total weight of said dispersion.

4,061,620
PHENOL-FORMALDEHYDE-RESORCINOL RESINS AND ADHESIVES

Maurice F. Gillern, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 450,126, March 11, 1974, abandoned.
This application Sept. 22, 1975, Ser. No. 615,215
Int. Cl.² C08L 61/10
U.S. Cl. 260—29.3 85 Claims

1. A liquid, water dilutable, phenolformaldehyde-resorcinol resin composition produced by reacting in an aqueous solution (1) a phenol-formaldehyde reaction product comprised of at least 65% monomeric methylolphenols, (2) free formaldehyde,

and (3) resorcinol at least until essentially all free formaldehyde is consumed, the molar quantities of combined formaldehyde, F_c, and phenol, P, in said reaction product, and the molar quantities of free formaldehyde, F_f, and resorcinol, R, satisfying the equation

$$0.5 \leqq \frac{F_c + F_f}{R + P} \leqq 0.8$$

wherein $F_c \geqq 0.9P$, $F_f \geqq 0.35P$ and $6P \geqq R \geqq 1.5P$.

4,061,621

PRODUCTION OF POLYCAPROAMIDE FIBER FROM POLYCAPROAMIDE REACTED WITH CYCLIC TETRACARBOXYLIC ACID DIANHYDRIDE

Robert Alden Lofquist, Richmond, and John Christopher Haylock, Midlothian, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 10, 1975, Ser. No. 622,273
Int. Cl.² C08G *69/14*
U.S. Cl. 260—78 L **7 Claims**

1. In a process for the formation of polycaproamide fiber from a fiber-forming polycaproamide polymer having excess number of carboxyl end groups over amino end groups, by melt-extruding the polymer through an orifice into a quenching medium and thereafter stretching the resulting filament, the improvement wherein said fiber-forming polycaproamide polymer is prepared by a process comprising:

a. continuously forming a molten polymerization mixture at 240°–290° C. from e-caprolactam;

b. continuously smoothly stirring said polymerization mixture while flowing over the surface thereof an inert gas at a flow rate of at least 2 unit volumes of said gas, measured at standard temperature and pressure, per hour per each unit volume of said polymerization mixture, until the total primary amino group plus carboxyl group analysis of the resulting hot water washed and dried polymer is between 105 and 115 milliequivalents per kilogram of polymer; and

c. continuously reacting said polymer at 250°–290° C. with about 0.1–0.7 mol per 100 mols of lactam in the polymer, of a cyclic tetracarboxylic acid dianhydride selected from the group consisting of pyromellitic dianhydride; 3,3',4,4'-benzophenone tetracarboxylic dianhydride; 1,4,5,8-naphthalenetetracarboxylic dianhydride; bicyclo[2.2.2]oct-7-ene-2,3,5,6-tetracarboxylic dianhydride; and tetrahydrofuran-2,3,4,5-tetracarboxylic dianhydride; until the primary amino group analysis of the polymer is between 18 and 34 milliequivalents per kilogram of polymer and the carboxyl group analysis of the polymer is between 50 and 90 milliequivalents per kilogram of polymer, thereby reducing the occurrence of nubs in the fiber.

4,061,622

PREPARATION OF POLYAMIDE FROM ORGANIC DIISOCYANATE WITH ALKALI METAL SALT OF ALCOHOL AS CATALYST

Besir K. Onder, North Haven, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 521,744, Nov. 7, 1974, Pat. No. 4,001,186. This application Oct. 26, 1976, Ser. No. 735,757
Int. Cl.² C08G *18/22*
U.S. Cl. 260—78 R **10 Claims**

1. In a process for preparing an essentially linear, dipolar aprotic solvent soluble solid polyamide by the condensation of an organic diisocyanate with a compound containing two carboxylic acid groups in said solvent, the improvement which comprises carrying out said process in the presence of a catalytic amount of a compound MOR, wherein R represents alkyl or aryl, and M is an alkali metal.

4,061,623

PREPARATION OF POLYAMIDEIMIDE FROM ORGANIC DIISOCYANATE WITH ALKALI METAL SALT OF ALCOHOL AS CATALYST

Besir K. Onder, North Haven, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 521,744, Nov. 7, 1974, Pat. No. 4,001,186. This application Oct. 26, 1976, Ser. No. 735,758
Int. Cl.² C08G *18/22, 73/14*
U.S. Cl. 260—78 TF **12 Claims**

1. In a process for preparing an essentially liner, dipolar/aprotic solvent soluble solid polyamideimide by the condensation of an organic diisocyanate with a compound contaning one carboxylic acid group and one intramolecular anhydride group or the free carboxylic acids thereof in said solvent, the improvement which comprises carrying out said process in the resence of a catalytic amount of a compound MOR, wherein R represents alkyl or aryl, and M is an alkali metal.

4,061,624

PROCESS FOR PREPOLYMERS AND PRODUCTS

William J. Schultz, Vadnais Heights, and Samuel Smith, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 26, 1976, Ser. No. 708,914
Int. Cl.² C08G *75/18*
U.S. Cl. 260—79.3 M **3 Claims**

1. Process for the preparation of linear terminally differentially electrophilically reactive prepolymer of tetramethylene oxide with 0 up to 50 mol% of comonomeric cationically polymerizable lactone or cyclic ether which comprises effecting polymerization of said tetramethylene oxide and said comonomeric lactone or cyclic ether at −20° to 80° C with initiator represented by the asymmetrical structure

$$YO_mSO_2R_nQ$$

wherein Q is a first radical which in anionic form is a nonterminating anion when 2 mol% of a dissolved salt of said anion is present during the polymerization of tetramethylene oxide containing 2 mole percent of ethylene oxide and 2 mol% of BF_3 as polymerization initiator at 20° C and said polymerization provides at least about 50 percent conversion of said monomers to polymer;

Y is a second radical free from alkylatable groups, selected from alkyl, alkaryl, aryl, aralkyl and cycloalkyl and having the free valence on a carbon atom devoid of halogen atoms;

$n = 0$ or 1;

$m = 0$ or 1 and

R is a divalent bridging radical comprising at least one oxytetramethylene radical, $—(OR')_q—$ where q is 1 to 300 and R' is alkylene of 2 to 10 carbon atoms at least one half of said alkylene groups being C_4H_8.

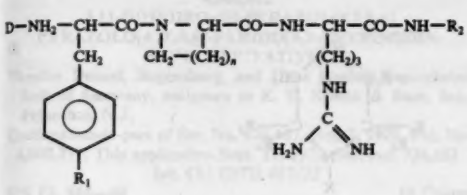
4,061,625

NOVEL CHROMOGENIC THROMBIN SUBSTRATES

Bo Thuresson Af Ekenstam, Molndal; Leif Eric Aurell; Karl Göran Claeson, both of Saro, and Birgitta Gunilla Karlsson, Molndal, all of Sweden, assignors to AB Kabi, Stockholm, Sweden

Filed June 17, 1976, Ser. No. 697,003
Int. Cl.² C07C *103/52*
U.S. Cl. 260—112.5 R **10 Claims**

1. Diagnostically active chromogenic substrate with a high specificity to thrombin and thrombin-like enzymes having the general formula:



and salts thereof, wherein R_1 is hydrogen or hydroxy, R_2 is nitrophenyl, and n is 1, 2 or 3.

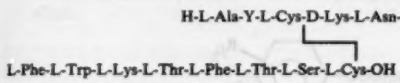
4,061,626

SOMATOSTATIN ANALOGS AND INTERMEDIATES THERETO

James E. Shields, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 29, 1976, Ser. No. 681,640
Int. Cl.[2] C07C *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 S **19 Claims**

1. A compound selected from those of the formula



and its pharmaceutically acceptable non-toxic acid addition salts, and R-L-Ala-Y-L-Cys(R_1)-D-Lys(R_2)-L-Asn-L-Phe-L-Phe-L-Trp(R_5)-L-Lys(R_2)-L-Thr(R_3)-L-Phe-L-Thr(R_3)-L-Ser(R_4)-L-Cys(R_1)-X; in which

Y is Gly or D-Ala;

R is hydrogen or an α-amino protecting group;

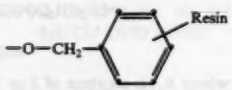
R_1 is hydrogen or a thio protecting group;

R_2 is hydrogen or an ϵ-amino protecting group;

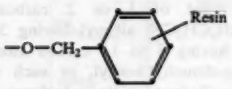
R_3 and R_4 each are hydrogen or a hydroxy protecting group;

R_5 is hydrogen or formyl; and

X is hydroxy or



in which the resin is polystyrene; with the proviso that, when X is hydroxy, each of R, R_1, R_2, R_3, R_4, and R_5 is hydrogen, and, when X is



each of R, R_1, R_2, R_3, and R_4 is other than hydrogen.

4,061,627

BIS-SUBSTITUTED NAPHTHALENE-AZO PHENYLENEAZO-STILBENE-DISULFONIC AND NAPHTHALENE-SULFONIC ACID

Ransom Brown Conrow, Pearl River; Seymour Bernstein, New City, and Norman Bauman, Nanuet, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 10, 1975, Ser. No. 612,169
Int. Cl.[2] C07C *107/06, 107/08;* **C09B** *35/02, 35/22*
U.S. Cl. 260—178 **3 Claims**

1. 4,4'-bis(2-amino-8-hydroxy-6-sulfo-2-naphthylazo)-2,2'-stilbenedisulfonic acid tetrasodium salt.

2. 5,5'-[oxybis-(2-amino-p-phenyleneazo)]bis-[6-amino-2-naphthalenesulfonic acid] disodium salt.

3. 5,5'-[oxybis-(2-nitro-p-phenyleneazo)]bis-]6-amino-2-naphthalenesulfonic acid] disodium salt.

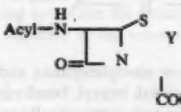
4,061,628

INTERMEDIATES FOR PRODUCING SEMI-SYNTHETIC PENICILLINS AND CEPHALOSPORINS AND METHODS OF PRODUCTION

John H. Sellstedt, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

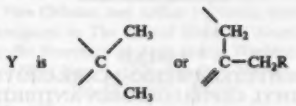
Division of Ser. No. 197,142, Nov. 9, 1971, Pat. No. 3,859,298. This application July 12, 1973, Ser. No. 378,727
Int. Cl.[2] C07D *501/04, 499/12*
U.S. Cl. 260—239.1 **15 Claims**

1. In a process for producing penicillins or cephalosporins of the formula:

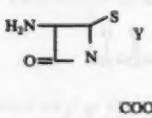


(A)

wherein:



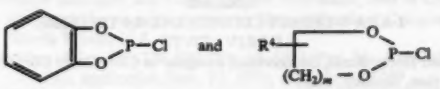
and R is hydrogen or acetoxy which comprises (a) reacting a salt from the group consisting of the alkali metal salts and tertiary amine salts of 6-aminopenicillanic acid or 7-aminocephalosporanic acids of the formula:



(B)

wherein Y is the same as in formula A above with a protective forming agent in the presence of an acid binding agent, then (b) reacting the resulting compounds with an acylating agent from a reactive derivative of a carboxylic acid to form the corresponding N-acyl derivatives, the improvement consisting essentially of employing as the protective forming agent a three valence phosphorus compound of the formula:

wherein R^1 and R^2 are lower alkyl, phenyl, halo(lower)alkyl or phenyl(lower)alkyl; or R^1 and R^2 together jointly form a ring compound selected from the group consisting of:



wherein m is a whole number from 1 to 2 and R^4 is selected from hydrogen and methyl; X signifies a halogen atom subjecting the N-acyl compounds of (b) above to hydrolysis to obtain the compounds of formula A, above.

4,061,629

6-AMINO-6-ARYLTHIO PENICILLANIC ACIDS AND DERIVATIVES THEREOF

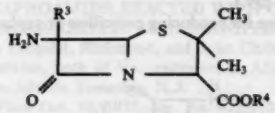
Joseph E. Dolfini; Ekkehard Böhme, both of Cincinnati, Ohio, and William A. Slusarchyk, Belle Mead, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 675,393, April 9, 1976, Pat. No. 4,029,669, which is a division of Ser. No. 500,435, Aug. 26, 1974, Pat. No. 3,965,093, which is a division of Ser. No. 183,642, Sept. 24, 1971, Pat. No. 3,855,233. This application Mar. 23, 1977, Ser. No. 780,623

Int. Cl.[2] A61K *31/43*

U.S. Cl. 260—239.1 1 Claim

1. A compound of the formula



wherein R^3 is phenylthio or nitrophenylthio; and R^4 is hydrogen, lower alkyl, trimethylsilyl, benzyl, benzhydryl, methoxybenzyl or trichloroethyl, and pharmaceutically acceptable salts thereof.

4,061,630

7-SUBSTITUTED-UREIDO-3-CARBAMOYLOXYMETHYL CEPHALOSPORIN ANTIBIOTICS

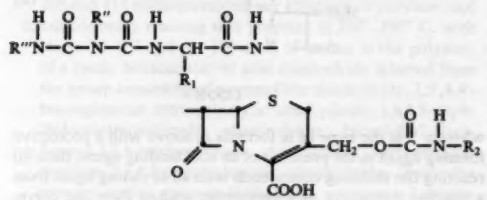
David K. Herron, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 20, 1976, Ser. No. 660,197

Int. Cl.[2] A61K *31/545*; C07D *501/20, 501/32, 501/34*

U.S. Cl. 544—16 8 Claims

1. A compound of the formula



wherein

R'' is hydrogen or methyl;

R''' is hydrogen, C_1–C_2 alkyl, allyl, phenyl, benzyl, or furfuryl;

R_1 is 2-thienyl, 2-furyl, phenyl, or phenyl substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, hydroxy, or nitro;

R_2 is hydrogen or C_1–C_3 alkyl;

and the pharmaceutically acceptable non-toxic salts thereof.

4,061,631

1-AZA-4-THIACYCLOHEXANE-4,4-DIOXIDE DERIVATIVES

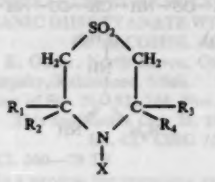
Jean Rody, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 407,000, Oct. 16, 1973, Pat. No. 3,943,098. This application Jan. 22, 1976, Ser. No. 651,500

Int. Cl.[2] C07D *279/12*

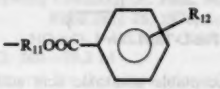
U.S. Cl. 544—53 15 Claims

1. A compound of formula I

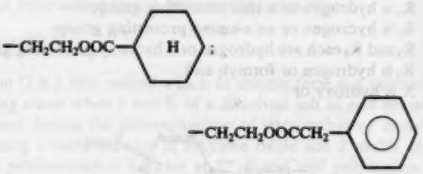


(I)

wherein R_1, R_2, R_3, and R_4 each independently are lower alkyl, R_1 and R_2 independently together with the carbon atom to which they are bound form a cycloalkyl ring, R_3 and R_4 independently together with the carbon atom to which they are bound form a cycloalkyl ring, or R_1 and R_2 and R_3 and R_4 together with the carbon atom to which they are bound form a cycloalkyl ring, and X is hydrogen; unsubstituted alkyl having 1 to 18 carbon atoms; alkyl having 2 to 20 carbon atoms which is substituted with hydroxy, carboxy, nitrile, sulphoxide, sulphone, or halo groups; $—CH_2COOR_8$ where R_8 is alkyl of 1 to 18 carbon atoms; $—R_9OOCR_{10}$ where R_9 is alkylene of 2 or 3 carbon atoms and R_{10} is alkyl of 1 to 17 carbon atoms;



where R_{11} is alkylene of 2 or 3 carbon atoms and R_{12} is alkyl of 1 to 4 carbon atoms;



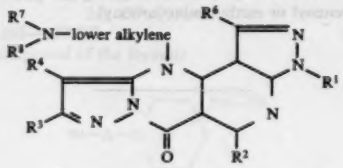
$—R_{13}NHCOR_{14}$ where R_{13} is alkylene of 2 or 3 carbon atoms and R_{14} is alkyl of 1 to 17 carbon atoms; $—R_{15}OR_{16}$ where R_{15} is alkylene or 2 carbon atoms and R_{16} is alkyl of 1 to 8 carbon atoms; $—R_{17}SR_{18}$ where R_{17} is alkylene of 2 or 3 carbon atoms and R_{18} is alkyl of 1 to 8 carbon atoms or phenyl; $R_{19}N(R_{20})_2$ where R_{19} is alkylene of 2 or 3 carbon atoms and R_{20} is independently H or alkyl of 1 or 2 carbon atoms; and $—CH_2CH_2NHCH_2CH_2CN$; alkenyl having 3 to 18 carbon atoms; alkynyl having 3 to 14 carbon atoms; benzyl, α-phenylethyl, α,α-dimethyl-benzyl, or such aralkyl groups substituted on the alkylene moiety by hydroxy, ester groups or halogen; acyl of the formula $R_7CO—$ wherein R_7 is alkyl having 1 to 18 carbon atoms; the acyl radical derived from benzoic acid, p-tert. butylbenzoic acid, p-tert. octylbenzoic acid, methanesulfonic acid, benzenesulphonic acid or p-toluenesulfonic acid; halogen; —O; —NO; or NR_5R_6 wherein R_5 and R_6 each independently represent hydrogen; unsubstituted alkyl having 1 to 12 carbon atoms; alkyl having 2 to 12 carbon atoms which is substituted with hydroxy, carboxy, nitrile, sulphoxide, sulphone or halo groups; or R_5 is $R_7CO—$ wherein R_7 is alkyl having 1 to 18 carbon atoms; or the acyl radical derived from benzoic acid, p-tert. butylbenzoic acid, p-tert. octylbenzoic acid, methanesulfonic acid, benzenesulphonic acid or p-toluenesulfonic acid; or R_5 and R_6 together with the nitrogen atom to which they are bound form the piperidine or morpholine ring, or its salts with organic or inorganic acids.

4,061,632
3,11-DIHYDRO-6H-PYRAZOLO[1,5-a] PYRAZOLO[4',3':5,6]-PYRIDO[4,3-d]PYRIMIDIN-6-ONE DERIVATIVES

Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 620,467, Oct. 7, 1975, Pat. No. 4,000,277. This application Sept. 17, 1976, Ser. No. 724,183
Int. Cl.[2] C07D *487/22*
U.S. Cl. 544—60 10 Claims

1. A compound of the formula



wherein

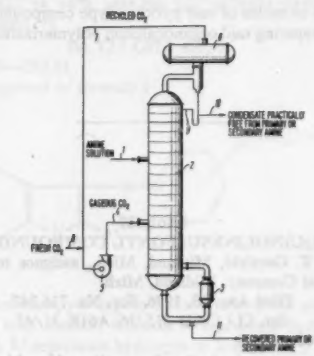
R^1 and R^3 each is hydrogen, lower alkyl, phenyl, or phenyl-lower alkylene; R^2, R^4 and R^6 each is hydrogen or lower alkyl;

is piperidino, morpholino, thiamorpholino or piperazino; and physiologically acceptable acid addition salts thereof.

4,061,633
METHOD OF RECOVERING PRIMARY AND SECONDARY AMINES

Lazar Isaevich Blyakhman, Krasnopresnensky val, 4/29, kv. 16; Sergei Lvovich Davydov, Tikhvinsky pereulok, 19, kv. 5a, both of Moscow, and Valentina Fedorovna Kashina, Moskovskoe shosse, 4, kv. 45, Dolgoprudny Moskovskoi oblasti, all of U.S.S.R.

Filed Feb. 25, 1974, Ser. No. 445,633
Int. Cl.[2] C07D *295/02*
U.S. Cl. 544—106 23 Claims



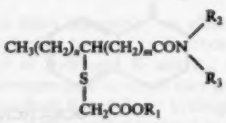
1. A method of concentrating a solution of an amine selected from the group consisting of primary amines and secondary amines, said amine having a pK_a value equal to at least 8.5, in a solvent selected from the group consisting of water, an organic liquid other than a primary or secondary amine and mixtures of water and said organic liquid, wherein said solution is obtained from a crude reaction mass, and said organic liquid is a conventional diluent present within said crude reaction mass, said method comprising the steps of continuously distilling said solution of said amine in the presence of CO_2 in a rectification column, wherein the middle part of said column is supplied with said solution of said amine, the bottom part of said column is supplied with gaseous CO_2 and a mixture of CO_2 and vapors of said solvent are directed from the top part of the column to a cooler where the vapors of said solvent are condensed and a gaseous stream comprising CO_2 is recycled to the bottom part of said column; returning part of the condensed solvent vapors in said cooler in reflux form to said rectification column; recovering the remainder of said condensed solvent vapors free from said amine; and supplying the amine from the bottom part of said rectification column to a boiler where said amine is partly evaporated; directing the vapors of said amine from said boiler into the bottom part of said rectification column and withdrawing the part of the amine which has not evaporated from the bottom part of said rectification column and said boiler as the final product, said CO_2 functioning to reduce the volatility of the amine without affecting the volatility of the solvent.

4,061,634
SULFUR-CONTAINING ANTIMICROBIAL ESTER-AMIDES

Robert R. Mod, New Orleans; Frank C. Magne, Metairie; Gene Sumrell, New Orleans, and Arthur F. Novak, Baton Rouge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

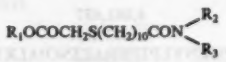
Filed Nov. 1, 1976, Ser. No. 737,457
Int. Cl.[2] C07D *295/18*
U.S. Cl. 544—158 10 Claims

1. A sulfur-containing ester amide having antimicrobial activity and the general structure:



where R_1 is a lower alkyl or alkenyl group of 1 to 6 carbons; R_2 and R_3 cojointly form a morpholine ring; $n + m$ add up to 15 and $n = m$ plus or minus 1.

9. A sulfur-containing ester amide having antimicrobial activity and the general structure:



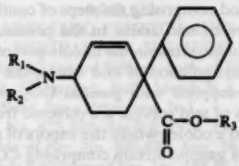
wherein R_1 is a lower alkyl or alkenyl group of 1 to 6 carbons; and R_2 and R_3 cojointly form a morpholine ring.

4,061,635
PROCESS FOR THE PREPARATION OF 1-PHENYL-4-AMINO-CYCLOHEX-2-ENE-1-CARBOXYLIC ACID ESTERS AND THE SALTS THEREOF

Gerhard Satzinger, and Manfred Franz Herrmann, both of Gundelfingen, Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 226,509, Feb. 15, 1972, Pat. No. 3,957,851. This application Nov. 22, 1974, Ser. No. 526,089
Claims priority, application Germany, Feb. 18, 1971, 2107871
Int. Cl.[2] C07D *295/00*
U.S. Cl. 544—172 17 Claims

1. 1-Phenyl-4-amino-cyclohex-2-ene-1-carboxylic acid esters of the formula:



wherein R_1 and R_2 together with the nitrogen atom to which they are attached form radicals which are selected from the group consisting of morpholino, piperidino, piperidino substituted in the 4 position by benzyl, phenyl, hydroxy, or lower alkyl of 1 to 4 carbon atoms, and piperazino substituted in the 4 position by benzyl, phenyl, hydroxy, lower alkyl of 1 to 4 carbon atoms, phenethyl, methoxyphenyl, chlorophenyl, or benzoyl, and wherein R_3 is a lower alkyl of 1–4 carbon atoms, and the pharmaceutically acceptable addition salts.

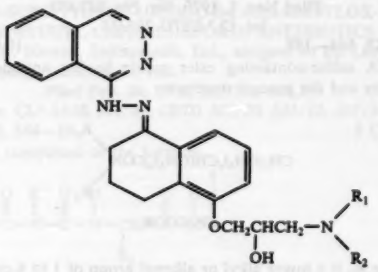
4,061,636

NAPHTHALENONE PHTHALAZINYLHYDRAZONES

Lawrence D. Wise, Denville, and Glenn C. Morrison, Randolph, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Feb. 12, 1976, Ser. No. 657,436
Int. Cl.² C07D *237/34, 413/12;* A61K *31/50*
U.S. Cl. 260—250 P **6 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen or alkyl of 1-6 carbon atoms, R_2 is alkyl of 1–6 carbon atoms, and the pharmaceutically acceptable acid addition salts, and N-oxides.

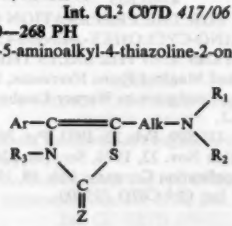
4,061,637

CERTAIN 4-ARYL-5-(4-PHENYLPIPERAZINO)ALKYL-4-THIAZOLIN-2-ONES

Elso Manghisi, Monza; Giuseppe Cascio, and Giancarlo Fregnan, both of Milan, all of Italy, assignors to Istituto Luso Farmaco d'Italia S.r.l., Milan, Italy

Filed May 12, 1975, Ser. No. 576,582
Claims priority, application Italy, May 14, 1974, 22693/74; Apr. 18, 1975, 22521/75
Int. Cl.² C07D *417/06*
U.S. Cl. 260—268 PH **9 Claims**

1. 4-Aryl-5-aminoalkyl-4-thiazoline-2-ones of the formula:



(I)

and their pharmaceutically acceptable salts, in which Ar represents phenyl, lower alkylphenyl, trifluoromethylphenyl, lower alkoxyphenyl, lower dialkylaminophenyl, halogen phenyl or lower alkylmercaptophenyl; Alk represents a saturated or unsaturated, linear or branched chain of 1 to 3 carbon atoms;

is a piperazine-4 subsituted by phenyl; Z represents an oxygen or sulfur atom; and R_3 represents a hydrogen atom or methyl, acetyl, benzoyl or methylaminocarbonyl.

4,061,638

ORGANOCALCIUMPYRIDINE-TYPE POLYMERIZATION INITIATORS

James D. Brown, and Carl A. Uraneck, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 441,773, Feb. 12, 1974, Pat. No. 3,997,708, which is a continuation-in-part of Ser. No. 790,429, Jan. 10, 1969, abandoned. This application Sept. 3, 1976, Ser. No. 720,316
Int. Cl.² C07D *213/02, 215/00*
U.S. Cl. 260—270 P **33 Claims**

1. A process for producing organocalcium polymerization initiators which comprises contacting substantially pure calcium metal with a pyridine type compound of 5 to 40 carbon atoms per molecule selected from the group consisting of pyridines, bipyridines, and polycyclic fused-ring aromatic compounds wherein at least one of said fused rings is a pyridine ring,

wherein said contacting is conducted in a diluent which is an ethereal diluent, hydrocarbon diluent, or mixture, and in the presence of an organic halogen-containing promoter, under effective contacting conditions in the substantial absence of oxygen and ammonia, at contacting temperatures, contacting time, and ratios of gram atoms of calcium metal to moles of said pyridine-type compound, effective for preparing said organocalcium polymerization initiator.

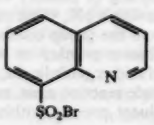
4,061,639

QUINOLINESULFONYL COMPOUNDS

Christian T. Goralski, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 23, 1976, Ser. No. 716,747
Int. Cl.² C07D *215/36;* A61K *31/47*
U.S. Cl. 260—283 S **1 Claim**

1. The compound which is 8-quinolinesulfonyl bromide and which corresponds to the formula



4,061,640

2-(BENZAMIDO PIPERIDINE) QUINOLYL DERIVATIVES

John Frederick Cavalla, Isleworth, and John Leheup Archibald, Windsor, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

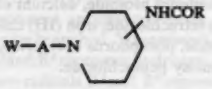
Continuation-in-part of Ser. No. 524,029, Nov. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 323,684, Jan. 15, 1973, abandoned, and a continuation-in-part of Ser. No. 175,345, Aug. 26, 1971, abandoned. This application July 29, 1976, Ser. No. 709,671

Claims priority, application United Kingdom, Sept. 3, 1970, 42090/70; July 22, 1971, 34376/71

Int. Cl.[2] C07D *215/14*

U.S. Cl. 260—287 CE 5 Claims

1. A compound of the formula



in which

W is 2-quinolyl or lower alkyl 2-quinolyl;

A is alkylene of 1 to 6 carbon atoms;

R is phenyl, halophenyl, lower alkoxy phenyl or lower alkyl phenyl;

or a pharmaceutically acceptable acid addition salt thereof.

4,061,641

UREIDOPIPERIDINO-KETOALKYL INDOLES

John Leheup Archibald, Windsor, and John Lambert Jackson, Royston, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

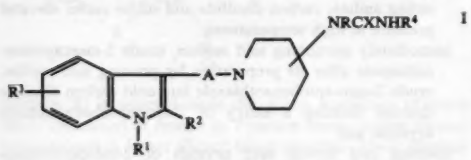
Continuation-in-part of Ser. No. 597,841, July 21, 1975, which is a continuation-in-part of Ser. No. 511,415, Oct. 2, 1974, abandoned. This application July 15, 1976, Ser. No. 705,647

Claims priority, application United Kingdom, Oct. 10, 1973, 47208/73; Jan. 25, 1974, 3531/74; Feb. 18, 1974, 7277/74; July 17, 1975, 30001/75

Int. Cl.[2] C07D *401/06*

U.S. Cl. 260—293.61 4 Claims

1. A compound of formula I



I

and pharmaceutically acceptable acid addition and quaternary ammonium salts thereof, wherein R represents hydrogen or lower alkyl, R^1 represents hydrogen or lower alkyl, R^2 represents hydrogen or lower alkyl, R^3 represents hydrogen, halogen, lower alkoxy, hydroxy, or lower alkyl, R^4 represents hydrogen, lower alkyl, cycloalkyl of 5 to 7 carbon atoms, thienyl, furyl, phenyl; phenyl mono- or disubstituted by halogen, lower alkyl, lower alkoxy, hydroxy, or trifluoromethyl; or benzoyl, halobenzoyl, lower alkanoyl, cycloalkanoyl of 6 to 8 carbon atoms, or thienoyl, A represents a monoketoalkylene radical having from 1 to 5 carbon atoms and X is oxygen or sulphur.

4,061,642

2,4,6-TRISUBSTITUTED-3-PYRIDINE CARBOXAMIDES

Erwin Fleckenstein, Hofheim, Taunus; Ernst Heinrich, Frankfurt am Main-Fechenheim, and Reinhard Mohr, Offenbach-Rumpenheim, all of Germany, assignors to Cassella Farbwerke Mainkur AG, Germany

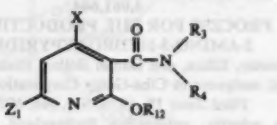
Division of Ser. No. 372,024, June 21, 1973. This application May 19, 1976, Ser. No. 687,705

Claims priority, application Germany, June 22, 1972, 2230392

Int. Cl.[2] C07D *213/56*

U.S. Cl. 260—295.5 A 3 Claims

1. A compound of the formula



wherein X is alkyl having 1 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, phenyl, benzyl, phenethyl or hydrogen; Z_1 is

,

—NH—OR_{10} or

;

R_3 and R_4, when taken separately, are alkyl having 1 to 6 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, phenyl, benzyl, phenethyl or hydrogen; R_3 and R_4, when taken together with the nitrogen atom to which they are attached form an ethyleneimino radical; R_5 and R_6 are hydrogen, alkyl having 1 to 6 carbon atoms, hydroxyalkyl having 1 to 6 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, methoxyalkyl or ethoxyalkyl having 1 to 6 carbon atoms in the alkyl moiety, benzyl or phenethyl; R_{10} is alkyl having 1 to 6 carbon atoms, benzyl or phenethyl; R_{11} is alkyl having 1 to 6 carbon atoms and R_{12} is alkyl having 1 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, phenyl, benzyl or phenethyl.

4,061,643

CERTAIN 16-ARYLOXY-11,12-SECO-PROSTAGLANDINS

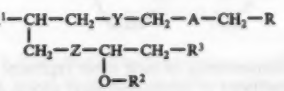
Edward J. Cragoe, Jr., and John B. Bicking, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 587,924, June 18, 1975, Pat. No. 4,020,177, which is a continuation-in-part of Ser. No. 502,126, Aug. 30, 1974, abandoned. This application Sept. 9, 1976, Ser. No. 721,734

Int. Cl.[2] C07D *307/54, 213/30*

U.S. Cl. 260—295 R 10 Claims

1. The compound of the formula



wherein

R is selected from the group consisting of carboxy and a carboxy salt, and alkoxycarbonyl (—COOAlk) wherein Alk is alkyl having 1–10 carbon atoms;

R^1 is selected from the group consisting of acetyl, propionyl, 1-hydroxyethyl, 1-hydroxypropyl and hydroxymethyl;
R^2 is hydrogen or lower alkanoyl;
R^3 is O—R^6 or wherein R^6 is pyridyl, pyrimidinyl, furfuryl, or thenyl;
A is methylene (—CH_2—);
Y is selected from the group consisting of ethylene, vinylene, or ethynylene;
and
Z is selected from the group consisting of ethylene, vinylene or ethynylene.

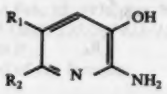
4,061,644

PROCESS FOR THE PRODUCTION OF 2-AMINO-3-HYDROXYPYRIDINES

Hans Greuter, Elken, and Daniel Bellus, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

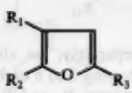
Filed June 18, 1976, Ser. No. 697,603
Claims priority, application Switzerland, June 27, 1975, 8379/75
Int. Cl.² C07D *213/74*
U.S. Cl. 260—296 R **6 Claims**

1. Process for the production of 2-amino-3-hydroxy-pyridines of formula I



(I)

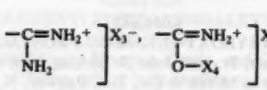
wherein R_1 and R_2 independently of one another represent hydrogen or an alkyl group having 1 to 4 carbon atoms, in which process a furan derivative of formula II



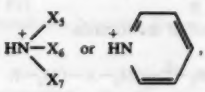
(II)

wherein
R_1 and R_2 have the meaning given under formula I, and R_3 represents a group COO^-M^+, —COO—X,

—MCOCL,



or —CN,
whereby
M+ denotes



X, X_1 and X_2 independently of each other represent hydrogen, an unsubstituted or substituted alkyl group, an alkenyl, cycloalkyl, phenyl, benzyl, or phenylethyl group, or a —CH_2-cycloalkyl group or —CH_2-oxacycloalkyl group, X_3^- represents —Cl^- or Br^- or F^-, X_4 represents an unsubstituted alkyl group, an allyl, cycloalkyl, benzyl or phenylethyl group, and X_5, and X_6 and X_7 independently of one another represent hydrogen or an alkyl group having 1 to 4 carbon atoms,
is reacted with ammonia in a closed reaction system at a temperature of between 100° and 300° C in a solvent containing amide groups selected from the group consisting of formamide, acetamide, N,N-dimethylformamide, N,N-dimethylacetamide, N-methyl-2-pyrrolidone, phosphoric acid tripyrrolidide and phosphoric acid-tris-(dimethylamide), in the presence of an acid catalyst selected from the group consisting of aliphatic C_1–C_8 mono-carboxylic acids, halogenated aliphatic C_1–C_4 mono-carboxylic acids, alkylsulfuric acids, aliphatic sulfonic acids, aromatic sulfonic acids, aliphatic phosphonic acids, aliphatic phosphinic acids, aromatic phosphonic acids, aromatic phosphinic acids, hydrohalic acids, nitric acid, phosphoric acid, sulfuric acid and ammonium salts of hydrohalic acids, and Lewis acids selected from the group consisting of aluminum chloride, aluminum bromide, calcium chloride, tin tetrachloride, titanium tetrachloride, iron (III) chloride, zinc chloride, boron trifluoride, phosphorus trichloride, antimony pentafluoride and antimony pentachloride.

4,061,645

2-TRICHLOROMETHYL-5-METHYLSULFINYL-1,3,4-THIADIAZOLE

Ludwig Nusslein; Ernst Albrecht Pierob, and Kurt Röder, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Continuation of Ser. No. 883,253, Dec. 8, 1969, abandoned. This application Oct. 17, 1972, Ser. No. 298,274
Int. Cl.² C07D *285/12*
U.S. Cl. 260—302 SD **1 Claim**

1. The compound 2-trichloromethyl-5-methylsulfinyl-1,3,4-thiadiazol.

4,061,646

PROCESS FOR PURIFICATION OF CRUDE 2-MERCAPTOBENZOTHIAZOLE

Yutaka Kawaoka, Yanai; Tatsuo Kifune, Yamaguchi; Masahiko Teshima, Yamaguchi, and Tatsuya Koizumi, Yamaguchi, all of Japan, assignors to Sanshin Kagaku Kogyo Company, Limited, Yamaguchi, Japan

Filed June 30, 1976, Ser. No. 701,227
Claims priority, application Japan, Jan. 14, 1976, 51-3056
Int. Cl.² C07D *277/72*
U.S. Cl. 260—306 **6 Claims**

1. A process for purifying crude 2-mercaptobenzothiazole, which comprises:
preparing a crude, molten 2-mercaptobenzothiazole by reacting aniline, carbon disulfide and sulfur under elevated pressure at high temperatures;
immediately quenching said molten, crude 2-mercaptobenzothiazole after its preparation by pouring said molten, crude 2-mercaptobenzothiazole into cold carbon disulfide thereby forming a slurry of 2-mercaptobenzothiazole crystals; and
filtering and drying said crystals of 2-mercaptobenzothiazole.

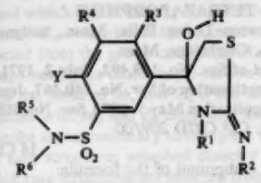
4,061,647

THIAZOLIDINE DERIVATIVES

Hans-Jochen Lang, Altenhain, Taunus, and Roman Muschaweck, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 27, 1976, Ser. No. 709,075
Claims priority, application Germany, July 29, 1975, 2533821
Int. Cl.² C07D *277/18*
U.S. Cl. 260—306.7 T **7 Claims**

1. Thiazolidine derivatives of the general formula I


(I)

in which R^1 represents alkyl or alkenyl radicals of 1 to 4 carbon atoms, cycloalkyl groups of 3 to 6 carbon atoms, R^2 represents an alkyl or alkenyl group of 1 to 6 carbon atoms which may be substituted by alkoxy groups of 1 to 2 carbon atoms, cycloalkyl groups of 3 to 8 carbon atoms, phenylalkyl groups of 1 to 2 carbon atoms in the alkyl moiety, and in which R^1 and R^2 together may represent an alkylene chain of 2 to 4 carbon atoms which may be branched, Y represents chlorine, bromine or methyl and R^3 and R^4 represent hydrogen, chlorine, bromine or methyl, the two radicals R^3 and R^4 representing at the same time neither hydrogen, nor chlorine, bromine or methyl, R^5 and R^6 represent hydrogen or lower alkyl of 1 to 4 carbon atoms, R^6 may additionally represent a phenylalkyl group, and their acid addition salts with physiologically tolerated acids.

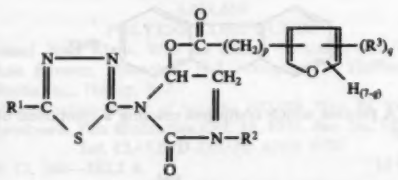
4,061,648

CERTAIN 5-ACYLOXY-1-THIADIAZOLYL-2-OXOIMIDAZOLIDINE COMPOUNDS

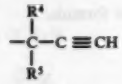
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 22, 1976, Ser. No. 668,755
Int. Cl.² C07D *285/12*
U.S. Cl. 260—/306.8 D **8 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower haloalkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and



wherein R^4 and R^5 are each selected from the group consisting of hydrogen and alkyl of up to 3 carbons atoms; p is an integer from 0 to 3; R^3 is selected from the group consisting of lower alkyl, chlorine, bromine and fluorine; and q is an integer from 0 to 2.

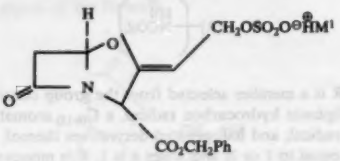
4,061,649

CLAVULANIC ACID SULPHATES

Thomas Trefor Howarth, Ewhurst, England, assignor to Beecham Group Limited, Great Britain

Filed Apr. 9, 1976, Ser. No. 675,273
Claims priority, application United Kingdom, Apr. 15, 1975, 15336/75
Int. Cl.² A61K *31/42*; C07D *498/04*
U.S. Cl. 260—307 FA **2 Claims**

1. A compound of the formula (V):



wherein M^1 is trimethylamine, dimethylalanine, pyridine, N-methyl-pyridine or N-methylmorpholino.

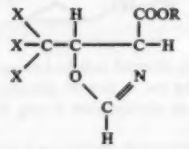
4,061,650

5-TRIHALOGENOMETHYL-4,5-DIHYRO-OXAZOLE-4-CARBOXYLIC ACID ESTERS

Munetsugu Miyoshi, Nishinomiya; Kazuo Matsumoto, Kawanishi; Yuji Urabe, and Tameo Iwasaki, both of Itami, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Nov. 26, 1975, Ser. No. 635,361
Claims priority, application Japan, Dec. 26, 1974, 49-619
Int. Cl.² C07D *263/14*
U.S. Cl. 260—307 F **1 Claim**

1. Trans-4-alkoxycarbonyl (or aralkyloxycarbonyl)-5-trihalogenomethyl-2-oxazoline of the formula:



wherein R is methyl, ethyl, propyl, isopropyl, butyl, isobutyl, tert-butyl, amyl, isoamyl, or benzyl, and X chlorine or bromine.

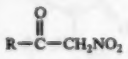
4,061,651

PREPARATION OF 3,5-DISUBSTITUTED-4-NITROISOXAZOLES

Richard F. Love, Fishkill, and Roger G. Duranleau, Ardonia, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed May 11, 1976, Ser. No. 685,221
Int. Cl.² C07D *261/14*
U.S. Cl. 260—307 H **13 Claims**

1. A method for the preparation of 3,5-disubstituted-4-nitroisoxazoles which comprises contacting an alpha-nitroketone corresponding to the formula:



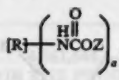
where R is an alkyl group having from 1 to 20 carbon atoms or an aryl group from 6 to 20 carbon atoms in a non-aqueous environment at a temperature of from about 50° to 150° C. with a basic catalyst, wherein said catalyst is a carbonate, fluoride, oxalate or C_{2-10} alkanoate of a metal of Group IA or IIA of the Periodic Table or a carbonate, fluoride, oxalate or C_{2-10} alkanoate of a strongly basic ion exchange resin, or a tertiary amine.

4,061,652
URETHANES OF HYDROXYBENZOTRIAZOLES

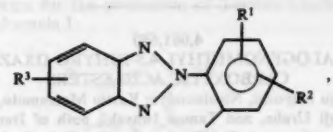
Siegfried H. Schroeter, and Daniel R. Olson, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 28, 1975, Ser. No. 626,490
Int. Cl.² C07D *249/20*
U.S. Cl. 260—308 B 3 Claims

1. Organic urethanes of the formula,



where R is a member selected from the group consisting of a $C_{(1-12)}$ aliphatic hydrocarbon radical, a $C_{(6-13)}$ aromatic hydrocarbon radical, and halogenated derivatives thereof, "*a*" is an integer equal to 1 or 2, and when a is 1, R is monovalent, and when *a* is 2, R is divalent, Z is an aromatic organic radical having the formula,



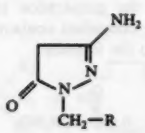
where R^1, R^2, and R^3 can be the same of different monovalent radicals selected from the group consisting of $C_{(1-12)}$ alkyl radicals, $C_{(1-4)}$ alkoxy radicals, halogen and hydrogen.

4,061,653
1-SUBSTITUTED-3-AMINO-PYRAZOL-5-ONES

Harald Horstmann; Karl Meng, both of Wuppertal, and Egbert Wehinger, Neviges, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 521,906, Nov. 7, 1974, which is a continuation of Ser. No. 371,959, June 21, 1973, abandoned. This application Dec. 4, 1975, Ser. No. 637,861
Claims priority, application Germany, June 23, 1972, 2230792; June 23, 1972, 2230675
Int. Cl.² C07D *231/38;* A61K *31/415*
U.S. Cl. 548—360 6 Claims

1. A compound of the formula



or a pharmaceutically-acceptable, nontoxic salt thereof, wherein

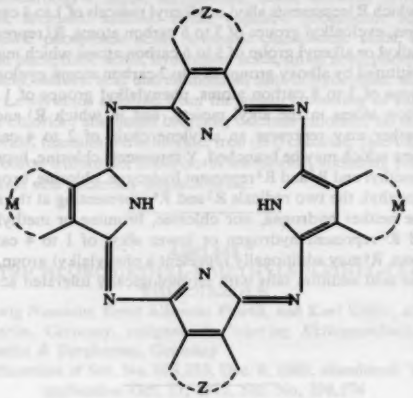
R is phenyl having an annellated saturated 5- or 6- membered isocyclic or heterocyclic ring wherein said heterocyclic ring has a sulphur heteroatom, a sulphur heteroatom and an oxygen heteroatom, or a sulphur heteroatom and two oxygen heteroatoms.

4,061,654
NOVEL TETRAZAPORPHINS

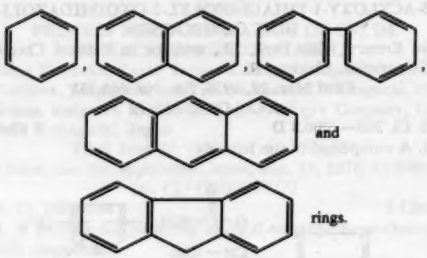
Elbert M. Idelson, Newton Lower Falls, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 159,492, July 2, 1971, abandoned, which is a continuation of Ser. No. 740,467, June 27, 1968, abandoned. This application May 9, 1973, Ser. No. 358,637
Int. Cl.² C07D *209/00*
U.S. Cl. 260—314.5 14 Claims

1. A phthalocyanine compound of the formula:



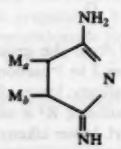
wherein M and Z comprise the atoms necessary to complete carbocyclic rings attached directly to the pyrrolenine ring and wherein M and Z are different ring structures, both being selected from the group consisting of



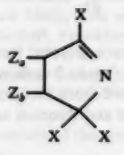
and

rings.

4. A process which comprises reacting a compound of formula:



with a compound of the formula:



in the presence of an acid acceptor and a hydroquinone compound which can donate hydrogen atoms and wherein M_a, M_b, Z_a, and Z_b comprise a hydrogen atom, an aliphatic moiety selected from the group consisting of alkyl, alkenyl and alkynl groups having no more than 6 carbon atoms inclusive, wherein M_a is the same as M_b and Z_a is the same as Z_b, and M_a taken together with M_b and Z_a taken together with Z_b can also comprise the atoms necessary to complete carbocyclic or heterocyclic ring structures attached directly to the pyrrolenine ring which ring structures are selected from the group consisting of unsubstituted, lower alkylsubstituted, lower alkoxysubstituted, and halosubstituted rings, and each X is a halogen atom.

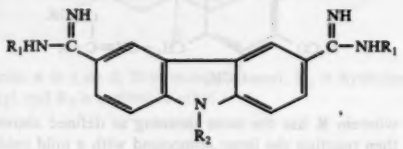
4,061,655

3,6-DICARBOXIMIDAMIDECARBAZOLES

Peter W. Sprague, Titusville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 30, 1976, Ser. No. 755,712
Int. Cl.² C07D *209/88*
U.S. Cl. 260—315 **10 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is phenyl or phenyl substituted with one or two methoxy, halogen or trifluoromethyl groups and R_2 is alkyl or arylalkyl; wherein alkyl is alkyl of 1 to 4 carbon atoms and aryl is phenyl or phenyl substituted with one or two alkyl, alkoxy of 1 to 4 carbon atoms, halogen or trifluoromethyl groups.

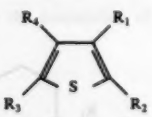
4,061,656

POLYENE COMPOUNDS

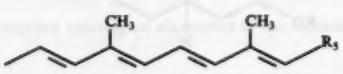
Michael Josef Klaus, Weil am Rhine, Germany, and Beverly Ann Pawson, Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 632,029, Nov. 14, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 733,507
Int. Cl.² C07D *333/24*; A01N *9/00*
U.S. Cl. 260—332.2 A **12 Claims**

1. A compound represented by the formula



wherein one of R_1 or R_2 is



and the other of R_1 or R_2 and R_3 and R_4 are hydrogen, lower alkyl, nitro, and R_5 is carboxyl, alkoxycarbonyl, alkenoxycarbonyl, and alkynoxycarbonyl.

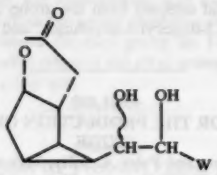
4,061,657

PROCESS FOR PREPARING A 2(R) OR 2(S) TRICYCLIC LACTONE GLYCOL

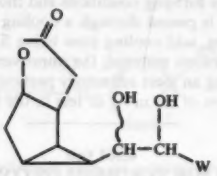
Verlan H. Van Rheenen, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 575,526, May 8, 1975, abandoned, which is a division of Ser. No. 374,348, June 28, 1973, abandoned. This application Sept. 23, 1976, Ser. No. 725,866
Int. Cl.² C07D *307/93*
U.S. Cl. 260—343.3 P **6 Claims**

1. A process for preparing an optically active 2S tricyclic lactone glycol of the formula



or a racemic compound of that formula and the mirror image of that formula, wherein W is 1-pentyl, cis 1-pent-2-enyl, or 1-pent-2-ynyl, and ~ indicates attachment of the hydroxyl to the side chain in alpha or beta configuration, which comprises starting with an optically active 2R tricyclic lactone glycol of the formula

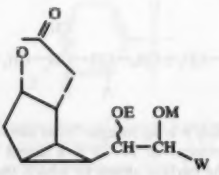


or a racemic compound of that formula and the mirror image of that formula, wherein W and ~ are as defined above, and subjecting said 2R glycol successively to the following reactions:

a. monosulfonation to replace the hydrogen of the C-2 hydroxyl with a sulfonyl group of the formula $—SO_2—R_3$ wherein R_3 is alkyl of one to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with one or 2 halo or alkyl groups of one to 4 carbon atoms, inclusive:

b. acylation to replace the hydrogen of the C-1 hydroxyl with an acyl group of the formula $—C(O)—R_4$ wherein R_4 is alkyl of one to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with one or 2 halo or alkyl groups of one to 4 carbon atoms, inclusive;

c. transformation of the product of step *b* to an optically active 2 S compound of the formula



or a racemic compound of that formula and the mirror image of that formula, wherein one of E and M is hydrogen and the other is an acyl group of the formula $—C(O)R_4$ wherein R_4 is as defined above, wherein ~ indicates attachment of the moi-

ety to the side chain in either alpha or beta configuration, and wherein W is as defined above; and

d. replacement of the acyl group —C(O)R_4 with hydrogen.

4,061,658

2,5-DIPICRYLFURANS

Joseph C. Dacons, Washington, D.C., and Michael E. Sitzmann, Adelphi, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 23, 1977, Ser. No. 780,630
Int. Cl.² C07D *307/40, 307/70*
U.S. Cl. 260—346.11 **4 Claims**

1. A compound selected from the group consisting of 2,5-dipicrylfuran, 2,5-dipicryl-3-nitrofuran, and 2,5-dipicryl-3,4-dinitrofuran.

4,061,659

PROCESS FOR THE PRODUCTION OF ETHYLENE OXIDE

Robert P. Nielsen, and Peter A. Kilty, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed June 28, 1976, Ser. No. 700,642
Int. Cl.² C07D *301/10*
U.S. Cl. 260—348.34 **9 Claims**

1. In a process for the production of ethylene oxide by catalytic oxidation of ethylene wherein ethylene and an oxygen-containing gas are passed through a reaction zone containing a fixed catalyst bed comprising a supported silver catalyst, at ethylene oxide forming conditions and the reaction product formed thereby is passed through a cooling zone adjacent to the reaction zone, said cooling zone being filled with an inert refractory particulate material; the improvement which comprises, employing an inert refractory particulate material having a surface area of 0.1 m^2/g or less in the cooling zone.

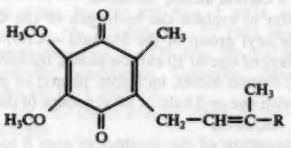
4,061,660

PROCESS FOR SYNTHESIS OF COENZYME Q COMPOUNDS

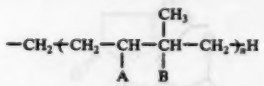
Shizumasa Kijima; Isao Yamatsu, both of Tokyo; Norio Minami, Kawasaki, and Yuichi Inai, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Sept. 22, 1976, Ser. No. 725,510
Claims priority, application Japan, Sept. 29, 1975, 50-116400
Int. Cl.² C07C *49/73; C07F 5/04*
U.S. Cl. 260—396 R **7 Claims**

1. A process for synthesizing 2,3-dimethoxy-5-methyl-6-substituted-1,4-benzoquinone having the formula

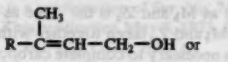


wherein R is

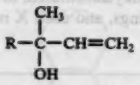


in which *n* is an integer from zero to 9, and A and B are hydrogens or A—B is a direct valence bond between the carbon atoms to which they are attached, which comprises

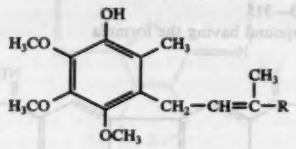
1. reacting 2-methyl-4,5,6-trimethoxyphenol with a compound selected from the group consisting of phenylboric acid, diphenylboric acid, tolylboric acid, methylboric acid, dimethylboric acid, ethylboric acid, propylboric acid, and anhydrides thereof to form the corresponding borate,
2. reacting the borate obtained in step (1) with a prenol compound having the formula



an iso-prenol compound having the formula



wherein R has the same meaning as defined above, or a corresponding halide derivative thereof, in the presence of a silica-alumina compound, to obtain the 2-methyl-3-substituted-4,5,6-trimethoxyphenyl borate
3. hydrolyzing the borate obtained in step (2) to obtain a compound having the formula



wherein R has the same meaning as defined above and then reacting the latter compound with a mild oxidizing agent to obtain a compound of the first-named formula.

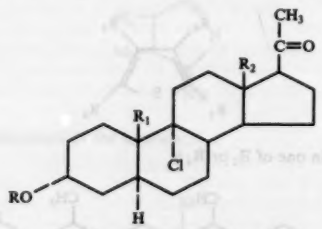
4,061,661

$\Delta^{9(11)}$-5α-20-KETO STEROIDS AND PROCESS FOR THEIR PRODUCTION

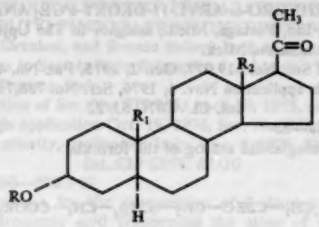
Ulrich Kerb; Rudolf Wiechert, and Otto Engelfried, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed June 8, 1976, Ser. No. 693,848
Claims priority, application Germany, June 11, 1975, 2526373
Int. Cl.² C07J *1/00*
U.S. Cl. 260—397.45 **13 Claims**

1. A process for the production of a 3α-acyloxy-9α-chloro-5α-20-ketopregnane of the formula

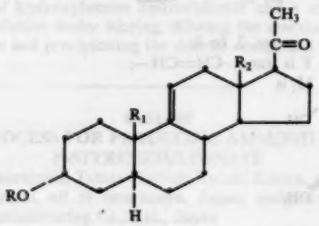


wherein R is the acyl radical of a carboxylic acid of up to 16 carbon atoms, R_1 is hydrogen or methyl and R_2 is methyl or ethyl, which comprises chlorinating a compound of the formula



wherein R, R_1 and R_2 have the values given above, with iodobenzene dichloride under irradiation.

5. A compound of formula



wherein *n* is 1 or 2, R is m-iodobenzoyl, R_1 is hydrogen or methyl and R_2 is methyl or ethyl.

4,061,662

REMOVAL OF UNREACTED TOLYLENE DIISOCYANATE FROM URETHANE PREPOLYMERS

Nelson Samuel Marans, and Alfred Gluecksmann, both of Silver Spring, Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 608,498, Aug. 28, 1975, abandoned. This application June 14, 1976, Ser. No. 695,344

Int. Cl.² C07C *119/042, 125/04*

U.S. Cl. 560—26 **16 Claims**

1. A method of reducing the residual unreacted tolylene diisocyanate content in the prepolymer reaction product of tolucne diisocyanate with a polyoxyalkylene polyol comprising allowing said prepolymer to flow through a column packed with absorbent type X zeolite molecular sieves.

4,061,663

PROCESS FOR PREPARATION OF ALIPHATIC PRIMARY SULFAMATES

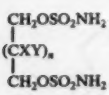
Allen Frederick Hirsch, Somerville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Oct. 2, 1975, Ser. No. 618,998

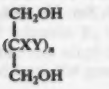
Int. Cl.² C07C *143/68*

U.S. Cl. 260—456 A **9 Claims**

1. The process for the preparation of a compound of the formula:



which comprises reacting an alkanediol of the formula:



with a substituted sulfamoyl halide of the formula:

$RNHSO_2M$

in the presence of a base and treating the resulting intermediate compound with a strong acid, wherein *n* is an integer from 0–8 and X and Y are hydrogen, provided that when *n* is 1, X and Y are hydrogen, lower alkyl having 1–3 carbon atoms, phenyl and benzyl and phenethyl, R is a protecting group capable of being removed by strong acid at a temperature between room temperature and 60° C, wherein the strong acid is selected from trichloroacetic acid, trifluoroacetic acid, methanesulfonic acid, sulfuric acid, and hydrochloric acid and the protecting group is selected from the group consisting of t-butyl, benzyl, α-alkyl benzyl wherein the alkyl group has 1–3 carbon atoms, allyl and 1-alkyl-allyl wherein the alkyl group has 1–3 carbon atoms, and M is a halogen.

4,061,664

PREPARATION OF PHENOXYBENZYL ESTERS

Derek A. Wood, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

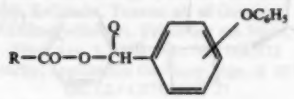
Filed Nov. 1, 1976, Ser. No. 737,312

Claims priority, application United Kingdom, Nov. 12, 1975, 46700/75

Int. Cl.² C07C *67/10, 69/74, 69/76, 121/66*

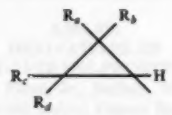
U.S. Cl. 260—465 D **5 Claims**

1. A process for the preparation of a phenoxybenzyl ester of the formula



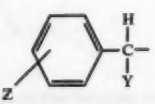
wherein Q is a hydrogen atom or a cyano group and R is

a. a cyclopropyl group of the formula

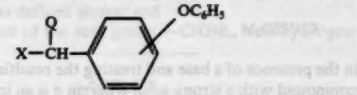


in which R_a and R_b each is an alkyl group containing from 1 to 6 carbon atoms, or a halogen atom of atomic number from 9 to 35, inclusive, or R_a is a hydrogen atom and R_b is an alkenyl group containing from 2 to 6 carbon atoms optionally substituted by from 1 to b 3 chlorine or bromine atoms, R_c R_d each is an alkyl group containing from 1 to 6 carbon atoms, or R_c is hydrogen and R_d is R_b, or R_a and R_b together or R_c and R_d together is an alkylene group containing from 2 to 6 carbon atoms; or

b. a benzyl group of the formula



in which Z is a halogen atom of atomic number 9 to 35, inclusive, or an alkoxy group containing from 1 to 4 carbon atoms and Y is an alkyl group containing from 1 to 6 carbon atoms, which process comprises neutralizing an acid of the formula R-COOH in which R is defined above with a water-soluble base, and then contacting the resulting product with a solution in a water-immiscible organic solvent of a benzyl halide of the formula



in which X is a halogen atom; and Q is defined above in the presence of a macrocyclic polyether phase-transfer catalyst.

4,061,665

5,6-DIDEHYDRO-ω-PHENOXY-PGE$_{2\alpha}$ ANALOGS

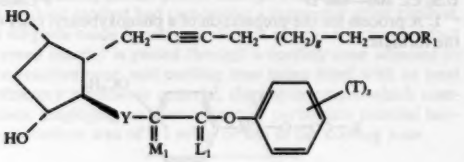
Chiu-Hong Lin, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 619,077, Oct. 2, 1975, Pat. No. 4,013,695. This application Nov. 4, 1976, Ser. No. 738,717

Int. Cl.^{2} C07C *65/22*

U.S. Cl. 260—410.9 R **24 Claims**

1. A prostaglandin analog of the formula



wherein *g* is one, 2, or 3;
wherein Y is trans—CH=CH—;
wherein M_1 is

or

wherein R_5 is hydrogen or methyl;
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and *s* is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein L_1 is

or a mixture of

and

wherein R_3 and R_4 are hydrogen or methyl being the same or different; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,061,666

5,6-DIDEHYDRO-ω-ARYL-11-DEOXY-PGE$_2$ ANALOGS

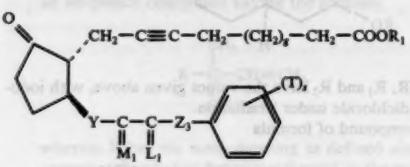
Chiu-Hong Lin, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 619,077, Oct. 2, 1975, Pat. No. 4,013,695. This application Nov. 4, 1976, Ser. No. 738,718

Int. Cl.^{2} C07C *65/22*

U.S. Cl. 560—53 **32 Claims**

1. A prostaglandin analog of the formula



wherein *g* is one, 2, or 3;
wherein Y is trans—CH=CH—;
wherein M_1 is

or

wherein R_5 is hydrogen or methyl;
wherein Z_3 is oxa or methylene, with the proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl;
wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein L_1 is

or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharamacologically acceptable cation.

4,061,667

CIS-2-METHYL-OCT-5-EN-2-YL ACETATE

Alfred A. Schleppnik, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 432,012, Jan. 9, 1974, Pat. No. 3,966,648, which is a division of Ser. No. 211,789, Dec. 23, 1971, Pat. No. 3,859,366. This application Mar. 24, 1975, Ser. No. 561,452

Int. Cl.^{2} C07C *69/145*

U.S. Cl. 560—261 **1 Claim**

1. Cis-2-methyl-oct-5-en-2-yl acetate.

4,061,668

PROCESS FOR THE PREPARATION OF 2-(4-ISOBUTYLPHENYL)-PROPIOHYDROXAMIC ACID

Giovanni Orzalesi, and Renato Selleri, both of Florence, Italy, assignors to Societa Italo-Britannica L. Manetti - H. Roberts & C., Florence, Italy

Continuation of Ser. No. 573,056, April 30, 1975, abandoned. This application Oct. 19, 1976, Ser. No. 733,942
Claims priority, application Italy, Dec. 6, 1974, 54400/74
Int. Cl.² C07C *83/10*
U.S. Cl. 260—500.5 H 1 Claim

1. A process for the preparation of 2-(4isobutylphenyl)-propiohydroxamic acid comprising the steps of forming a mixture of 2-(4-isobutylphenyl)-propionitrile as a starting compound and anhydrous methanol, saturating said mixture with dry hydrochloric gas under cooling, reacting and then diluting the reaction product by ethyl ether, whereby a precipitate is formed, reacting the precipitate with a mixture of a methanol solution of hydroxylamine hydrochloride and a sodium hydroxide solution under stirring, diluting the reaction product with water and precipitating the desired compound by carbon dioxide.

4,061,669

PROCESS FOR PRODUCING AMMONIUM P-STYRENESULFONATE

Kanzi Katsuragawa; Tatsuo Hattori; Keiichi Kihara, and Hanzo Tamabayashi, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Aug. 28, 1975, Ser. No. 608,701
Claims priority, application Japan, Aug. 29, 1974, 49-98423
Int. Cl.² C07C *143/24*
U.S. Cl. 260—505 N 5 Claims

1. A process for continuously producing ammonium p-styrenesulfonate from an alkali metal p-styrenesulfonate which comprises producing an amine salt of p-styrenesulfonic acid by contacting an aqueous solution of an alkali metal p-styrenesulfonate with a mineral acid salt of an organic amine having more than 7 carbon atoms in an organic solvent; contacting the organic solution of an amine salt of p-styrenesulfonic acid with ammonia to produce ammonium p-styrenesulfonate and to produce said organic amine; and reacting said organic amine with a mineral acid to reproduce said mineral acid salt of said organic amine and recycling said reproduced salt back to the first step.

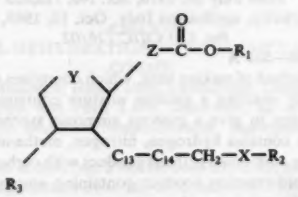
4,061,670

15-DEOXY-16-HYDROXY-16-VINYL AND CYCLOPROPYL SUBSTITUTED PROSTANOIC ACIDS AND CONGENERS

Middleton Brawner Floyd, Jr., Suffern, N.Y.; Martin Joseph Weiss, Oradell, N.J.; Charles Vincent Grudzinskas, Garnerville, N.Y., and Sow-Mei Lai Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

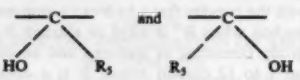
Filed July 19, 1976, Ser. No. 706,343
Int. Cl.² C07C *177/00*
U.S. Cl. 260—514 D 13 Claims

1. An optically active compound of the formula:



or a racemic mixture of that formula and the mirror image thereof wherein R_1 is selected from the group consisting of hydrogen and alkyl having from 1 to 12 carbon atoms; R_2 is selected from the group consisting of alkyl having from 3 to 7 carbon atoms; R_3 is hydroxy; Y is a divalent moiety of the formulae:

X is a divalent moiety selected from the group consisting of those of the formulae:



wherein R_5 is selected from the group consisting of vinyl and cyclopropyl; Z is a divalent moiety of the formulae:

$$-CH_2-\overset{cis}{CH=CH}-(CH_2)_n-,$$

wherein n is an integer from 3 to 5, inclusive; the moiety -C_{13}-C_{14}-is trans-vinylene; and the pharmacologically acceptable cationic salts thereof when R_1 is hydrogen.

4,061,671

ANALOGUES OF PROSTAGLANDINS

Gerhard Beck, Frankfurt am Main; Rudolf Kunstmann, Hofheim, Taunus; Milos Babej, Frankfurt am Main, and Hermann Teufel, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 1, 1975, Ser. No. 563,973
Claims priority, application Germany, Apr. 3, 1974, 2416193
Int. Cl.² C07C *177/00*
U.S. Cl. 260—514 D 3 Claims

1. 9-oxo-11α,15-dihydroxy-16,16-dimethyl-18-oxa-5-cis-13-trans-prostadienoic acid.

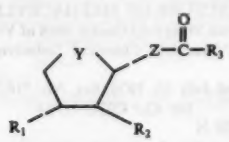
4,061,672

DERIVATIVES OF 9-HYDROXY-13-TRANS-PROSTENOIC ACID

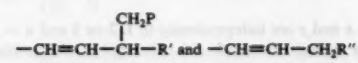
Middleton Brawner Floyd, Jr., Suffern, N.Y.; William James McGahren, Demarest; Robert Eugene Schaub, Upper Saddle River, both of N.J., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 480,989, June 19, 1976, Pat. No. 3,950,406, Continuation-in-part of Ser. No. 274,769, July 24, 1972, abandoned. This application Jan. 26, 1976, Ser. No. 652,354
Int. Cl.² C07G *177/00*
U.S. Cl. 260—514 D 13 Claims

1. An optically active compound of the formula:

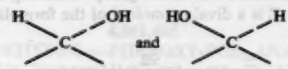


or a racemic compound of that formula wherein R_1 is selected from the group consisting of hydroxy, lower alkoxy, and ω-hydroxy substituted lower alkoxy; R_2 is a moiety selected from the group consisting of those of the formulae:

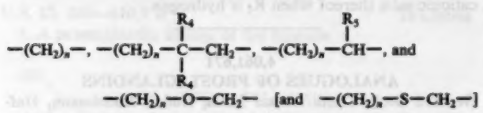


wherein P is hydroxy, R′ is a straight chain alkyl group having

from 2 to 10 carbon atoms or a straight chain alkyl group having from 2 to 6 carbon atoms and having one branched alkyl group of from 1 to 3 carbon atoms, R'' is a straight chain alkyl group having from 2 to 10 carbon atoms and substituted with an hydroxy, a straight chain alkyl group having from 2 to 6 carbon atoms and having one branched alkyl group of from 1 to 3 carbon atoms and substituted with an hydroxy group, a straight chain alkenyl group having from 2 to 10 carbon atoms and substituted with a hydroxy, or a straight chain alkyl group having from 2 to 6 carbon atoms and having one branched alkyl group of from 1 to 3 carbon atoms and substituted with a hydroxy; with the proviso that a hydroxy group may not be on a tertiary carbon when R'' is alkyl or alkenyl; R_3 is selected from the group consisting of hydroxy and an alkoxy group having from 1 to 12 carbon atoms; Y is a divalent radical selected from the group consisting of those of the formulae:



and Z is a divalent radical selected from the group consisting of those of the formulae:



wherein n is an integer from 3 to 8 inclusive, R_4 is an alkyl group having up to 3 carbon atoms, and R_5 is an alkyl group having up to 3 carbon atoms a fluorine atom or a phenyl group; and the pharmacologically acceptable cationic salts thereof when R_3 is hydroxy.

4,061,673

MANUFACTURE OF METHACRYLIC ACID

Takeru Onoda, and Masayuki Otake, both of Yokohama, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed July 30, 1976, Ser. No. 710,340
Int. Cl.² C07C 51/24
U.S. Cl. 260—526 N **6 Claims**

1. In a process for the manufacture of methacrylic acid which comprises reacting oxygen and isobutyric acid in vapor phase in the presence of a supported catalyst containing a heteropolyacid having the general formula:

$$H_{3+x}Mo_{12-x-y}W_yV_xPO_{40}$$

wherein x and y are independently 0, 1, 2 or 3 and $x + y < 5$, and/or a reduced form of said heteropolyacid, the improvement wherein the carrier for said catalyst has a SiO_2 content of at least 70% and a water absorbability of at least 60%.

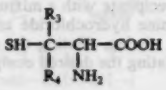
4,061,674

PROCESS OF MAKING PENICILLAMINE

Friedrich Asinger, Rott; Wolf-Dieter Pfeifer; Heribert Offermanns, both of Grossauheim; Paul Scherberich, Neu Isenburg, and Gerd Schreyer, Grossauheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Continuation of Ser. No. 317,403, Dec. 21, 1972, Pat. No. 3,946,069. This application Feb. 12, 1976, Ser. No. 657,605
Claims priority, application Germany, Dec. 22, 1971, 2163810
The portion of the term of this patent subsequent to Mar. 23, 1993, has been disclaimed.
Int. Cl.² C07C 99/00
U.S. Cl. 260—534 S **7 Claims**

1. A process for the production of a compound having the formula

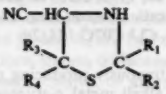


I

wherein:

R_3 and R_4 are each alkyl of 1 to 6 carbon atoms or which together form a closed ring,

which process comprises heating in two stages in the presence of at least a stoichiometric amount of water and hydrochloric acid a thiazolidine-4-carbonitrile having the formula:



II

wherein:

R_3 and R_4 have the meaning as above, and

R_1 and R_2 are each alkyl of 1 to 6 carbon atoms or which together form a closed ring, or are alkenyl of 2-4 carbon atoms or alkyl-substituted aryl, the alkyl substituent having a total of 1–2 carbon atoms,

the heating in the first stage being conducted at a temperature between 20° and 80° C in hydrochloric acid having a concentration of at least 30% by weight of hydrogen chloride, and the heating in the second stage being conducted at a temperature between 80° and 110° C in hydrochloric acid having a concentration of at least 10 and at most 30% by weight of hydrogen chloride and extracting the compound above I or its hydrochloride from the mixture.

4,061,675

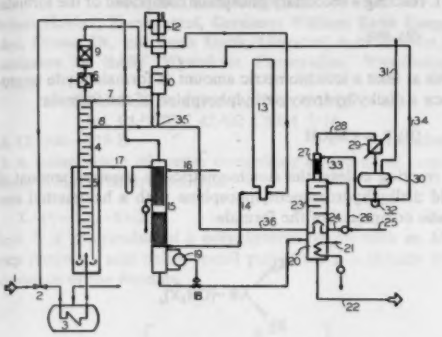
PROCESS FOR THE SYNTHESIS OF UREA FROM CARBON DIOXIDE AND AMMONIA

Renzo Gagliardi, Terni, Italy, assignor to Snam Progetti S.p.A., Milan, Italy

Filed July 30, 1976, Ser. No. 710,323
Claims priority, application Italy, Oct. 15, 1969, 40806/69
Int. Cl.² C07C 126/02
U.S. Cl. 260—555 A **3 Claims**

1. In a method of making urea, which comprises synthesizing ammonia by reacting a gaseous mixture containing nitrogen and hydrogen to give a gaseous ammonia synthesis product which also contains hydrogen, nitrogen, methane and argon, reacting the ammonia synthesis product with carbon dioxide to form a liquid reaction product containing ammonium carbamate, and dissociating said ammonium carbamate to form urea; the improvement comprising contacting the hot ammonia synthesis effluent with the liquid effluent from the urea synthesis reactor in order to dissociate the ammonium carbamate contained in said effluents into a gaseous effluent containing

ammonia, carbon dioxide and oxygen and to produce a further liquid product containing urea, removing oxygen from said



carbamate dissociation effluent, and thereafter feeding the deoxygenated effluent to the ammonia synthesis step.

4,061,676
RECOVERY OF DOXYCYCLINE AND PRODUCTS THEREOF

Ivan Villax, 1, Travessa do Ferreiro, Lisbon-3, Portugal

Continuation of Ser. No. 159,462, July 2, 1971, abandoned. This application Mar. 23, 1976, Ser. No. 669,655

Claims priority, application Portugal, July 3, 1970, 54109; Sept. 10, 1970, 54109; June 9, 1971, 54109

Int. Cl.² C07C *103/19*

U.S. Cl. 260—559 AT **7 Claims**

1. A process for the recovery of α-6-deoxy-5-hydroxytetracycline in high purity from the crude reaction mixture resulting from the conversion of an intermediate into said α-6-deoxy-5-hydroxytetracycline and having the same as well as reaction by-products, degradation products and the β-isomer as impurities, said crude reaction mixture being the initial reaction mixture in which the α-6-deoxy-5-hydroxytetracycline is present prior to the institution of any recovery procedures, which consists essentially of the steps of (1) first acidifying said crude reaction mixture with a concentrated aqueous solution of methanesulfonic acid, sulphuric acid or hydrochloric acid, (2) then heating to a temperature of 60° to 90° C until said impurities are further degraded, (3) cooling said reaction mixture and then (4) precipitating said α-6-deoxy-5-hydroxytetracycline from said reaction mixture thus treated and cooled, in the form of water insoluble acid addition salts and molecular complexes selected from the group consisting of 5-sulfosalicylate, N,N'-dibenzylethylenediamine- and N,N'-dibenzylethylenediimine molecular complexes, N,N'-dibenzylethylenediamine alkaline earth metal and, N,N'dibenzylethylenediimine alkaline earth metal molecular complexes by adding the corresponding acid or molecular complex to said treated and cooled reaction mixture, said steps (1) – (4) being carried out sequentially without any intervening steps.

4,061,677
PARTIAL DEHYDRATION OF CYCLOHEXANONE OXIME

Kurt Kahr, Hambach; Hanns Pohl, Lambsheim; Guenther Rapp, Ludwigshafen, and Peter Lauz, Annweiler, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 276,814, July 31, 1972, abandoned. This application June 28, 1976, Ser. No. 700,541

Claims priority, application Germany, Aug. 4, 1971, 2138930

Int. Cl.² C07C *131/04*

U.S. Cl. 260—566 A **6 Claims**

1. A process for partial dehydration of cyclohexanone oxime by treatment with an aqueous solution of an inorganic salt wherein crude cyclohexanone oxime is extrated countercurrently at a temperature of from 65° C to the boiling temperature of the two-phase mixture in an extraction column with a concentrated solution of a salt selected from the group consisting of ammonium sulfate, hydroxylammonium sulfate, ammonium chloride, ammonium phosphate, and mixtures of ammonium sulfate and hydroxylammonium sulfate, and the salt solution is separated from the partly dehydrated cyclohexanone oxime, concentrated again by evaporation and returned for dehydration of the oxime.

4,061,678
PROCESS FOR THE PREPARATION OF AROMATIC POLYAMINES

Hartmut Knöfel, Leverkusen, and Günther Ellendt, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 29, 1975, Ser. No. 645,042

Claims priority, application Germany, Jan. 9, 1975, 2500573

Int. Cl.² C07C *85/24*

U.S. Cl. 260—570 D **6 Claims**

1. A process for the preparation of multi-nuclear aromatic polyamines comprising:

a. condensing an aromatic amine with formaldehyde in the presence of a hydrophobic solvent and in the absence of an acid catalyst to produce a pre-condensate mixture containing the corresponding N,N'-disubstituted aminals,

b. removing substantially all the water from said pre-condensate mixture to produce a first organic phase,

c. extracting said first organic phase with an aqueous solution containing an acid catalyst thereby producing a second organic phase and an aqueous pre-condensate phase which contains said aminals,

d. subjecting said aqueous pre-condensate phase to a rearrangement reaction thereby producing an aqueous condensation mixture containing said aromatic polyamines:

e. extracting said aqueous condensation mixture with a hydrophobic solvent to provide a solvent phase and an aqueous phase which comprises an aqueous solution containing the acid catalyst as an amine salt of said aromatic amine, and of said aromatic polyamines,

f. recovering aromatic polyamines from said solvent phase, and

g. returning said aqueous phase to step (c).

4,061,679
STEREOSPECIFIC TOTAL STEROIDAL SYNTHESIS VIA SUBSTITUTED C/D-TRANS INDANONES

Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

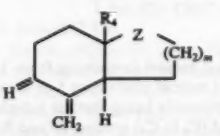
Division of Ser. No. 482,711, June 24, 1974, Pat. No. 3,984,474, which is a division of Ser. No. 765,023, Oct. 4, 1968, Pat. No. 3,897,460. This application July 14, 1976, Ser. No. 705,306

The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

Int. Cl.² C07C *49/54*

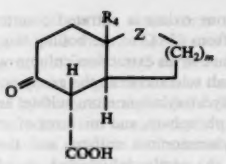
U.S. Cl. 260—586 F **1 Claim**

1. A process for the preparation of a compound of the formula



wherein R_4 is hydrogen or lower alkyl; Z is carbonyl; *m* is an integer having the value of 1 or 2,

which comprises dissolving a compound of the formula



wherein R_4, Z and *m* are as defined above in dimethylsulfoxide and then adding to the reaction mixture formaldehyde in the presence of a compound selected from the group consisting of methylamine, butylamine, benzylamine and heterocyclic secondary amines and salts thereof derived from strong mineral acids or organic acids at a temperature from about 15° to about 40° C.

4,061,680

METHOD OF PRODUCING HIGH-BOILING BYPRODUCTS OF ISOPRENE PRODUCTION

Evgeny Vasilievich Bart, prospekt Morisa Toreza, 18, kv. 69; Oleg Efimovich Batalin, ulitsa Ordzhonikidze, 45, korpus 1, kv. 85, both of Leningrad; Andrian Petrovich Troitsky, ulitsa Miklukho-Maklaya, 65, korpus 2, kv. 48; Nina Andreevna Skachkova, Scherbakovskaya ulitsa, 7, kv. 31, both of Moscow; Vladimir Mikhailovich Lebedev, Jubileiny prospekt, 30, kv. 98, Khimiki Moskovskoi oblasti, and Rimma Petrovna Trifonova, Scherbakovskaya ulitsa, 9, kv. 102, Moscow, all of U.S.S.R.

Filed Apr. 1, 1975, Ser. No. 563,951
Int. Cl.² C07C *47/04, 11/08, 11/18*
U.S. Cl. 260—606 **1 Claim**

1. A method of processing high-boiling byproducts obtained at the first stage of isoprene production by the dioxane method into isoprene, isobutylene and formaldehyde comprising catalytically splitting said byproducts in the vapour phase in the presence of water with a weight ratio therebetween of 1:1+2, respectively, at 250°-290° C over aluminium oxide as catalyst to obtain a vapour mixture; catalytically splitting said vapour mixture over calcium-phosphate catalyst at 315°-360° C to obtain a reaction mixture containing isoprene, isobutylene and formaldehyde.

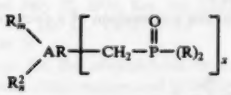
4,061,681

METHOD FOR THE PREPARATION OF MONO- OR POLY [DIALKYL OR DICYCLOALKYLPHOSPHONYLMETHYL] AROMATIC CARBOCYCLIC COMPOUNDS

Ray Leonard Hillard, and Norma Ann Weston, both of R.D. Annandale, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 12, 1976, Ser. No. 731,288
Int. Cl.² C07F *9/53*
U.S. Cl. 260—606.5 P **12 Claims**

1. A method for the preparation of a phosphine oxide represented by the formula:



wherein R represents an alkyl radical containing from 1 to 8 carbon atoms or a cycloalkyl radical containing 5 or 6 carbon atoms in a ring, said ring optionally being further substituted with one or more lower alkyl (C_1 to C_4) groups; R^1 and R^2 are, individually, methyl, ethyl, or methoxy radicals; AR is benzene or naphthalene; and when AR is benzene, *m* and *n* are, individually, integers from 0 to 5, inclusive, and *x* is an integer from 1 to 6, inclusive; when AR is naphthalene, *m* and *n* are, individually, integers from 0 to 3, inclusive, and *x* is an integer from 1 to 4, inclusive, which comprises:

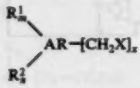
1. reacting a secondary phosphine compound of the formula:

$$(R)_2PH$$

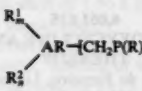
with at least a stoichiometric amount of formaldehyde to produce a dialkylhydroxymethylphosphine of the formula:

$$(R)_2P-CH_2OH$$

2. reacting at least the stoichiometrically required amount of said dialkylhydroxymethylphosphine with a halomethyl aromatic compound of the formula:



wherein X is a halogen atom, to produce a tertiary phosphine of the formula:



and

3. oxidizing said tertiary phosphine compound.

4,061,682

PREPARATION OF SYMMETRICAL ETHERS

Robert A. Dubois, Framingham, and Harold H. Freedman, Newton Center, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 23, 1975, Ser. No. 598,529
Int. Cl.² C07C *41/00*
U.S. Cl. 260—611 A **12 Claims**

1. A process for preparing symmetrical ethers comprising reacting by contacting a primary or secondary alkyl or inertly-substituted alkyl halide, sulfate, or sulfonate, with an alkali metal hydroxide or alkaline earth metal hydroxide in the presence of both a catalytic amount of a quaternary ammonium salt or a quaternary phosphonium salt of the formula

$$R_1R_2R_3R_4Q^+A^-$$

wherein Q is a quaternized atom of nitrogen or phosphorus, A is a neutralizing anion, and R_1-R_4 are hydrocarbyl groups of from 1 to about 16 carbon atoms each with a combined minimum total of at least about 10 carbon atoms and a catalytic amount of a carboxylate salt or thiocarboxylate salt comprised of an alkyl, aryl, arylalkyl, cycloalkyl or inertly-substituted derivatives thereof, carboxylate or thiocarboxylate anion and an alkali metal or alkaline earth metal cation.

4,061,683

DIPHENYL ETHER DERIVATIVES

Friedrich Karrer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 328,218, Jan. 31, 1973, abandoned. This application Sept. 9, 1975, Ser. No. 611,731
Int. Cl.² C07C *43/22*
U.S. Cl. 260—613 R **9 Claims**

1. 1-Phenoxy-4-(3-methyl-3-methoxy-pentyl-1-oxy)-benzene.

9. 1-Phenoxy-4-(4-pentinyl-1-oxy)-benzene.

4,061,684

HIGHLY BRANCHED POLYETHER POLYOLS OF HIGH MOLECULAR WEIGHT

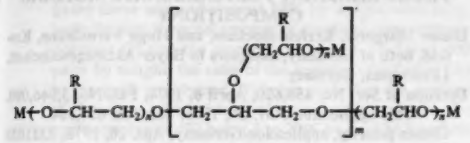
Herbert Helfert, Frankenthal, Germany; William Keith Langdon, Grosse Ile, and Pauls Davis, Gibraltar, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 29, 1976, Ser. No. 736,939
Int. Cl.[2] C07C *43/00*; C10M *7/16*
U.S. Cl. 260—615 B 5 Claims

1. A composition of matter comprising a mixture of compounds of the structural formula

$$X-(Y-X)_p-Y-X$$

where X is the residue of a polyglycerol polyol with an M group removed, said polyglycerol polyol being a mixture of compounds of the formula



where

R is hydrogen or a methyl group and in which at least 75% of the R groups are hydrogen, M is hydrogen or an alkali metal, *m* is an integer having an average value greater than 5, and *n* is an integer having an average value high enough to provide a compound mixture having more than 95% alkylene oxide moieties,

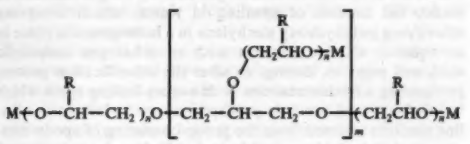
Y is the residue of a diol containing 2 to 6 carbon atoms with two —OH groups removed therefrom, and

p is an integer of 0 to 10 such that the molecular weight of the molecule exceeds 12,000, but not 50,000.

2. A method of producing a composition of matter comprising a mixture of compounds of the structural formula

$$X-(Y-X)_p-Y-X$$

where X is the residue of a polyglycerol polyol with an M group removed, said polyglycerol polyol being a mixture of compounds of the structural formula



where

R is hydrogen or a methyl group and in which at least 75% of the R groups are hydrogen, M is hydrogen or an alkali metal, *m* is an integer having an average value greater that 5, and *n* is an integer having an average value high enough to provide a compound mixture having more than 95% alkylene oxide moieties,

Y is the residue of a diol containing 2 to 6 carbon atoms with two —OH groups removed therefrom, and

p is an integer of 0 to 10 such that the molecular weight of the molecule exceeds 12,000, but not 50,000, said method comprising the steps of forming as a first solution an anhydrous, alkali-catalyzed solution of a starting material comprising a mixture of compounds having the structural formula defined above in an inert organic solvent,

forming a second anhydrous solution comprising a difunctional coupling agent selected from the group consisting of the benzenesulfonic and toluene acid diesters of diols containing 2 to 6 carbon atoms in an inert organic solvent, and

reacting said second solution with said first solution at a temperature from 20° to 250° C to obtain a coupled product having a molecular weight of over 12,000, but less than 50,000.

4,061,685

CATALYTIC SYNTHESIS OF PHENOLS

Frank Julian Weigert, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 547,959, Feb. 7, 1975, abandoned. This application May 5, 1976, Ser. No. 683,394
Int. Cl.[2] C07C *39/04*
U.S. Cl. 260—621 G 14 Claims

1. A process which consists essentially in reacting a cyclic or an open-chain alkane or alkene of 6 to 10 carbon atoms having a continuous chain of at least six successive carbon atoms, each of which is bonded directly to no more than three carbon atoms, with water in a nonoxidative atmosphere at a temperature of 350° to 700° C and at a contact time of about 0.01 second to about 10 minutes, in the presence of a metal oxide catalyst selected from oxides of Al, Bi, Cd, Ce, Cr, Cu, Fe, In, Mn, Mo, Sn, Te, Th, Ti, U, V, W, Zn and Zr to produce a phenol.

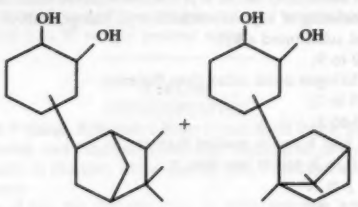
4,061,686

CYCLOHEXANE DIOL COMPOSITION

John B. Hall, Rumson, and Wilhelmus Johannen Weigers, Red Bank, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 662,818, March 1, 1976, Pat. No. 4,014,944. This application Dec. 22, 1976, Ser. No. 753,618
Int. Cl.[2] C07G *35/14*
U.S. Cl. 260—631 R 1 Claim

1. A diol composition consisting essentially of a mixture of compounds represented by the structures:



4,061,687

OXO PROCESS WITH RECOVERY OF COBALT HYDROCARBONYL IN SOLUTION FOR RECYCLE

Manfred Kaufhold, and Horst-Dieter Wulf, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Continuation-in-part of Ser. No. 315,823, Dec. 18, 1972, abandoned. This application Apr. 8, 1975, Ser. No. 566,523
Claims priority, application Germany, Dec. 30, 1971, 2165515
Int. Cl.[2] C07C *29/16*
U.S. Cl. 260—632 HF 9 Claims

1. In the oxo process for converting higher olefins having 10 – 15 carbon atoms in the presence of a catalyst comprising cobalt hydrocarbonyl dissolved in a solvent, hydrogen and carbon monoxide to the respective oxo alcohols and decobalting said oxo alcohols with a first aqueous solution of an organic acid having 1 to 3 carbon atoms to form a second aqueous solution of an organic cobalt acid salt having 1 to 3 carbon atoms, the improvement comprising:

a. said solvent consisting essentially of a butanol selected

from the group consisting of n-butylalcohol, isobutylalcohol, secbutylalcohol and mixtures thereof;

b. treating said second aqueous solution in the presence of said solvent with a gaseous mixture of carbon monoxide and hydrogen at a temperature between about 140° to 200° C and a pressure between about 100 to 300 atmospheres to form a homogenous liquid phase;

c. cooling said homogenous liquid phase at a temperature of about 0° C to 110° C and thereby separating said homogenous liquid phase into an aqueous liquid phase and an organic liquid phase consisting essentially of butanol and cobalt hydrocarbonyl; and

d. recycling said organic liquid phase as said cobalt hydrocarbonyl dissolved in a solvent.

4,061,688

LIQUID PHASE FLUORINATION PROCESS

James J. Maul, Grand Island, and Victor A. Pattison, Clarence Center, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Dec. 6, 1976, Ser. No. 748,018
Int. Cl.[2] C07C *25/14*
U.S. Cl. 260—651 F 30 Claims

1. A process for the preparation of fluorinated aromatic compounds of the formula

$$R_nAR(CF_wX_p)_Z$$

comprises contacting at least one haloalkyl aromatic compound of the formula

$$R_nAR(CF_wX_p)_Z$$

in the liquid phase, with hydrogen fluoride in the presence of a catalyst acid system comprising fluosulfonic acid wherein

Ar is aryl

R is a substituent on the aryl nucleus selected from the group consisting of aryl, substituted aryl, halogen, alkyl, alkoxy, and substituted alkyl;

n is 0 to 9;

X is halogen atom other than fluorine;

w is 0 to 2;

p is 1 to 3;

w' is 1 to 3, and is greater than *w;*

p' is 0 to 2, and is less than *p;*

$w + p$ is 3;

$w' + p'$ is 3;

Z is 1–10; and

the maximum value of $n + Z$ is 10.

4,061,689

PROCESS FOR THE CONVERSION OF AROMATIC HYDROCARBONS

Ji-Yong Ryu, and Dalia Germanas, both of Des Plaines, Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1975, Ser. No. 644,785
Int. Cl.[2] C07C *3/56*
U.S. Cl. 260—671 R 12 Claims

1. A process for the alkylation of an aromatic hydrocarbon comprising contacting the aromatic hydrocarbon with an alkylating agent at aromatic hydrocarbon alkylation conditions in the presence of a catalyst prepared by reacting titanium tetrafluoride with a support which contains surface hydroxyl groups and thereafter reducing with hydrogen at an elevated temperature to form titanium subfluoride, and recovering an alkylated aromatic hydrocarbon as a product of the process.

4,061,690

METHOD OF CATALYTIC CONVERSION OF BUTANE

Jean-Rene Bernard, Saint-Symphorien; Jacques Bousquet, Irigny, and Michel Grand, Saint-Symphorien, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed June 9, 1976, Ser. No. 694,434
Claims priority, application France, June 17, 1975, 75.18911
Int. Cl.[2] C07C *3/42*
U.S. Cl. 260—676 R 16 Claims

1. A method of catalytic conversion of a butane cut to propane, wherein said method consists in introducing into a reaction zone containing a catalyst consisting of acid mordenite on the one hand a butane cut and on the other hand hydrogen so that the partial hydrogen pressure is higher than 5 bar.

4,061,691

FLAME-RESISTANT POLYCARBONATE MOLDING COMPOSITIONS

Dieter Margotte, Krefeld-Bockum, and Hugo Vernaleken, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 458,620, April 8, 1974, Pat. No. 3,946,090.
This application Nov. 24, 1975, Ser. No. 634,984
Claims priority, application Germany, Apr. 26, 1973, 2321055
Int. Cl.[2] C08L *67/02*
U.S. Cl. 260—860 6 Claims

1. A molding composition having an oxygen index of greater than 0.30 according to ASTM D-2863/70 comprising an aromatic polycarbonate having a molecular weight of between about 10,000 and 100,000 containing 0.5 to 20 percent by weight of a saturated, thermoplastic polyester fiber which is stable in a melt of the polycarbonate.

4,061,692

PROCESS FOR THE MANUFACTURE OF SWELLABLE, ABSORPTIVE POLYMERS OF POLYHYDROXY METHYLENE

Arno Holst, and Michael Kostrzewa, both of Wiesbaden, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Sept. 13, 1976, Ser. No. 722,624
Claims priority, application Germany, Sept. 15, 1975, 2541035
Int. Cl.[2] C08F *291/08, 18/24, 261/00*
U.S. Cl. 260—874 5 Claims

1. A process for the manufacture of absorptive polymers which are at least more than 50 per cent by weight insoluble in water, but capable of swelling in water, which comprises etherifying polyhydroxy methylene in a homogeneous phase in an aqueous alkaline solution with an α-halogen carboxylic acid, and prior to, during, or after the etherification process performing a further reaction with a cross-linking agent which is polyfunctional towards polyhydroxy methylene in an alkaline medium selected from the group consisting of epoxy compounds, halohydrins, polychlorinated higher alcohols, divinyl sulfone, acid chlorides, dichloroacetic acid and compounds in which the groups which are functional towards polyhydroxy methylene are the acryl amido group, the chloro azomethine group, or the allyloxy azomethine group.

4,061,693

RESIN COMPOSITION

Shigemitsu Kamiya, Kamakura, Japan, assignor to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Apr. 18, 1977, Ser. No. 788,433
Int. Cl.[2] C08L *51/04*
U.S. Cl. 260—876 R 7 Claims

1. An acrylonitrile resin composition capable of affording shaped articles having superior alcohol resistance, impact strength, transparency and gas-impermeability, said composition consisting essentially of

A. a resinous copolymr obtained by polymerizing a monomeric mixture consisting of

1. 60 to 90% by weight of acrylonitrile,
2. 1 to 35% by weight of at least one acrylic monomer selected from the group consisting of alkyl acrylates and alkyl methacrylates with the alkyl group containing 1 to 6 carbon atoms, and
3. 0.5 to 15% by weight of an alkyl methacrylate with the alkyl group containing 12 to 18 carbon atoms; and

B. a graft copolymer obtained by polymerizing

1. 40 to 80 parts by weight of a monomeric mixture consisting of (i) 30 to 90% by weight of acrylonitrile, (ii) 1 to 70% by weight of at least one acrylic monomer selected from the group consisting of alkyl acrylates and alkyl methacrylates with the alkyl group containing 1 to 6 carbon atoms and (iii) 0 to 15% by weight of an alkyl methacrylate with the alkyl group containing 12 to 18 carbon atoms, in the presence of
2. 20 to 60 parts by weight of a diene-type rubbery polymer composed of at least 50% by weight of a conjugated diene unit and at most 50% by weight of an acrylonitrile unit, the total amount of the diene-type rubbery polymer (2) and the monomeric mixture (1) being 100 parts by weight; the ratio of the resinous copolymer (A) to the graft copolymer (B) being such that the content of the diene-type rubber polymer used to prepare the graft copolymer (B) being 3 to 20% by weight based on the weight of the composition.

4,061,694

LOW TEMPERATURE IMPACT STRENGTH MOLDING COMPOSITIONS

Eugene Gennaro Castagna, Clark, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Dec. 21, 1976, Ser. No. 753,060
Int. Cl.[2] C08F *297/08, 8/06, 8/50*
U.S. Cl. 260—878 B **14 Claims**

1. A polypropylene molding resin of improved low temperature impact strength obtained in a process comprising

I. providing a block copolymer having a melt flow rate in the range of from about 0.5 to about 1.5 grams per 10 minutes at 230° C and containing

a. from about 60 to about 95 percent by weight of a polypropylene block and

b. from about 5 to about 40 percent by weight of a block of a random copolymer of ethylene and another α-olefin, wherein the content of ethylene derived units in said random copolymer block ranges between 30 and 60 weight percent,

II. contacting said block copolymer with an oxygen containing compound selected from air, elemental oxygen, inorganic peroxide, organic peroxide, or mixtures thereof; melting and working the mixture of oxygen containing compound and block copolymer in a high shear zone to subject the mixture to substantial oxidative degradation, and

III. recovering a polymer product having a melt flow rate which is higher than that of the block copolymer provided in Step I.

4,061,695

PHOSPHATE ESTERS

Yun Ten Tai, Palos Hills; Lawrence A. Mura, Homewood; Kenneth G. Phillips, River Forest, and Edward G. Ballweber, Glenwood, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 14, 1975, Ser. No. 632,066
Int. Cl.[2] C07F *9/09*; C02B *5/06*
U.S. Cl. 260—929 **5 Claims**

1. An organophosphate composition comprising on a 100 weight percent total weight basis

a. from about 5 to 70 weight percent water, and

b. the balance up to 100 weight percent thereof being a phosphate ester composition,

c. said phosphate ester composition comprising on a 100 weight percent total weight basis

1. from 0 to about 15 weight percent inorganic phosphate,
2. the balance up to 100 weight percent of any given said phosphate ester composition being organophosphate material, and
3. said organophosphate material containing on a 100 weight percent total organophosphate weight basis from about 20 to 60 weight percent of polymeric material, said composition having been produced by the steps of

A. simultaneously

1. heating in a reaction zone at a temperature of from about 130° to 175° C at least one phosphoric acid material selected from the group consisting of phosphoric acid and polyphosphoric acid in admixture with at least one polyol which is characterized by

a. having from 2 to 7 carbon atoms per molecule,

b. having from 2 to 4 hydroxyl groups per molecule distributed so that not more than one oxygen atom is substituted on each carbon atom per molecule, and

c. being selected from the group consisting of hydroxyl substituted saturated aliphatic hydrocarbons,

in the presence of a minor amount of at least one inorganic base selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides, and ammonia, the mole ratio of said polyol to said phosphoric acid material as charged to said zone ranging from about 0.5 to 1.5, and the mole ratio of said inorganic base to said phosphoric acid material being from about 0.1 to 1.0,

2. maintaining said reaction zone at a subatmospheric pressure, ranging from greater than 0 to about 400 mm Hg., and
3. removing water from said zone at a rate at least about equal to the rate water generated in said reaction zone;

B. cooling the resulting reaction product to a temperature in the range of from about 60° to 130° C; and

C. admixing the so-cooled reaction product with and dissolving same in sufficient water to form a product solution comprised on a 100 weight percent total weight basis from about 5 to 70 weight percent water.

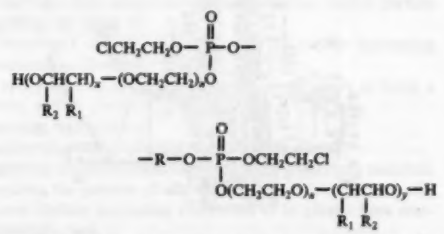
4,061,696

DIPHOSPHATES

Hartfrid Vollmer, Erftstadt Liblar; Franz-Josef Dany, Erftstadt Lechenich, and Joachim Wortmann, Turnich, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 521,501, Nov. 6, 1974, Pat. No. 3,998,764. This application Sept. 28, 1976, Ser. No. 727,459
Claims priority, application Germany, Nov. 9, 1973, 2356033
Int. Cl.[2] C07F *9/12*
U.S. Cl. 260—930 **4 Claims**

1. Agents which reduce the flammability of polyurethane moulding compositions, the agents being compounds of the following general formula



in which R is phenylene, or alkyl- or halogen-alkyl-substituted diphenylene methane, R_1 and R_2 are hydrogen, alkyl or a halo-

gen-substituted alkyl of 1 - 4 carbons, $x + y$ is a number of 0.1–3, and n is 1 or 2.

4,061,697

PHOSPHORUS CONTAINING FLAME RETARDING AGENTS WHICH ARE REACTIVE WITH ISOCYANATES

Hans Hübner, Leverkusen; Johannes Blahak, Cologne, and Hans-Joachim Meiners, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

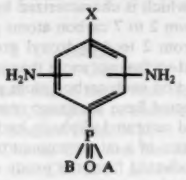
Filed Dec. 4, 1975, Ser. No. 637,630

Claims priority, application Germany, Dec. 17, 1974, 2459491

Int. Cl.[2] C07F 9/40

U.S. Cl. 260—944 **6 Claims**

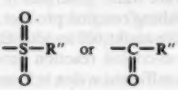
1. Flame retarding agents represented by the general formula



wherein

A and B, either both represent —OR groups wherein R represents an optionally branched C_1–C_8 alkyl group, or one represents a —OR group as defined above and the other represents an optionally branched C_1–C_{17} alkyl group, and

X represents hydrogen, halogen, an optionally branched C_1–C_8 alkyl group, a C_6–C_{12} aryl or aralkyl group, NH_2, CF_3, CN, COOR',



wherein:

R' represents hydrogen or an optionally branched alkyl or cycloalkyl group having 1–10 C atoms and

R'' represents an optionally branched alkyl or cycloalkyl group having 1–10 C atoms.

4,061,698

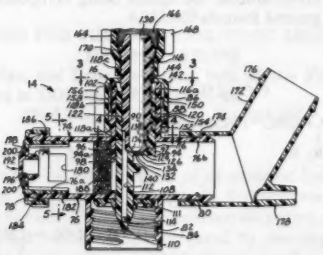
HUMIDIFIER-NEBULIZER APPARATUS

Everett D. Thornwald, Glenview, Ill., assignor to Aerwey Laboratories, Inc., Deerfield, Ill.

Filed Apr. 18, 1975, Ser. No. 569,229

Int. Cl.[2] B01F 3/04; A61M 15/00

U.S. Cl. 261—78 A **6 Claims**



1. A humidifier-nebulizer apparatus for use with a source of pressurized gas, comprising, in combination, a liquid reservoir defining a primary liquid adapted to contain a quantity of liquid and having a humidifier discharge passage communicating with said primary chamber, said reservoir having an opening at its lower end defined by a generally annular wall, sparger means supported by said reservoir and including a liquid impervious bottom wall sealingly secured at its peripheral edge to said annular wall within said opening and a sparger plate spaced from said bottom wall and having a plurality of flow orifices therethrough, said sparger plate having a depending wall formed thereon the lower edge of which abuts said bottom wall, said depending wall being spaced inwardly from and parallel to said annular wall of said reservoir to define an annular passage therebetween, said depending wall having at least one opening therein, a filler tube extending generally longitudinally upwardly along said primary chamber and having a lower end connected to said annular wall such that the interior of said filler tube is in communication with said annular passage, and adapter head means mounted on said liquid reservoir, said adapter head means including a nebulizer discharge passage, a gas inlet passage connectible to a source of pressurized gas, a liquid supply passage in flow communication with the interior of said filler tube, a venturi passage in communication with said nebulizer discharge passage and said gas input passage, an aspiration passage communicating with said venturi passage and said liquid supply passage, and a bypass passage for selectively substantially bypassing input gas around said venturi passage, said adapter head being manipulatable to a first position to cause said bypass passage to be blocked such that pressurized gas introduced into said gas input passage will pass through said venturi passage and draw a liquid from said primary chamber for discharge in a nebulized gas-liquid state from said nebulizer discharge passage, said adapter head being further manipulatable to a second position wherein said bypass passage is in communication with said gas input passage and said liquid supply passage such that gas introduced into said gas input passage is caused to flow through said bypass passage and through said filler tube and sparger plate into said primary liquid chamber for discharge in a humidified state from said humidifier discharge passage.

4,061,699

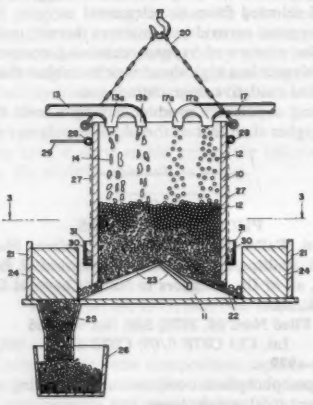
CONTINUOUS PROCESS FOR PRODUCING OXIDE REFRACTORY MATERIAL

Paul Cichy, Buffalo, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 312,442, Dec. 6, 1972, which is a division of Ser. No. 153,317, June 15, 1971, Pat. No. 3,726,621. This application July 29, 1974, Ser. No. 492,628

Int. Cl.[2] B22D 23/08

U.S. Cl. 264—5 **6 Claims**



1. A continuous process for rapidly cooling and solidifying a melt of oxide refractory material, comprising the steps of:

providing, within a solidification chamber comprising a hollow cylindrical outer wall, said solidification chamber having a lower end having therein an opening, an initial supply at least 15 cm in depth of a non-reactive, non-melting particulate solid steel sphere cooling media, said solid steel sphere cooling media being of a material other than that of the oxide refractory material to be cooled and solidified; said cooling media having a size ranging from about 5 to about 60 mm;

2. casting a melt of the oxide refractory material into the solidification chamber over the cooling media, whereby the melt is rapidly cooled and solidified;

3. simultaneously with the casting of the oxide refractory melt into the solidification chamber, adding additional solid steel sphere cooling media having a size ranging from about 5 to about 60 mm over the initial supply of cooling media, the oxide refractory melt being cast upon both the initial supply and the added cooling media; and

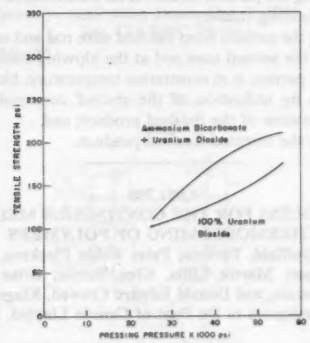
4. recovering the cooling media and solidified oxide refractory melt through the opening in the lower end of the solidification chamber.

4,061,700

FUGITIVE BINDER FOR NUCLEAR FUEL MATERIALS

Timothy Joseph Gallivan, Wilmington, N.C., assignor to General Electric Company, San Jose, Calif.

Filed Sept. 10, 1975, Ser. No. 612,084
Int. Cl.² G21C *21/00*
U.S. Cl. 264—0.5 **9 Claims**



1. A process for sintering a body of nuclear fuel material comprising the steps of

a. admixing the nuclear fuel material in a particulate form with a binder having a particle size less than 400 mesh so as to achieve a uniform dispersal of said binder in the nuclear fuel material so that said binder and said nuclear fuel material undergo adhesion, said binder being comprised of ammonium bicarbonate, ammonium bicarbonate carbamate, ammonium sesquicarbonate, ammonium carbamate and mixtures thereof,

b. forming the resulting mixture by pressing into a green body having a density ranging from about 30% to about 70% of theoretical density,

c. heating said green body at a temperature sufficient to decompose substantially all of the binder into gases that enter an atmosphere maintained over said green body,

d. heating the body at a temperature sufficient to produce a sintered body and further decompose any binder residues that enter the atmosphere maintained over said body, and

e. cooling the sintered body in the atmosphere maintained over said body.

4,061,701

MANUFACTURE OF SOFT AND RESILIENT FOAMS

Fritz Stastny, Ludwigshafen; Rudolf Gaeth, Limburgerhof; Udo Haardt, and Heinz-Hermann Koerner, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Dec. 12, 1973, Ser. No. 423,888
Claims priority, application Germany, Dec. 20, 1972, 226225
Int. Cl.² C08J *9/00*
U.S. Cl. 264—51 **3 Claims**

1. A process for the manufacture of composite soft and resilient foams by foaming, in a mold, a mixture of

A. foamed soft and resilient particles of olefin polymers selected from the group consisting of homopolymers of ethylene, propylene, butylene and copolymers of ethylene with other ethylenically unsaturated monomers containing more than about 50 percent by weight of copolymerized ethylene units, having more than 25% X-ray crystallinity at 25° C, of particle size from about 3 to 50 mm and bulk density from 5 to 100 g/l and

B. a foamable mixture of polyisocyanates, polyols, water, catalysts and, optionally, other auxiliaries for the manufacture of polyurethane foams,

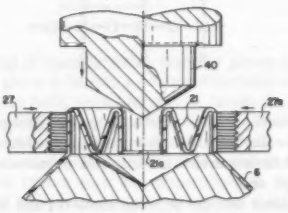
wherein approximately 90 to 30% of the volume of the mold is filled with foamed soft and resilient particles (A), either in loose form or as agglomerates fused or stuck together and the foamable mixture (B) is injected into the communicating cavities thereby produced, under a pressure of 1.5 to 8 bars, and is allowed to foam up.

4,061,702

METHOD OF MAKING A PLASTIC CONTAINER

Milton Kessler, 6690 Harrington Ave., Youngstown, Ohio 44512

Continuation-in-part of Ser. No. 552,111, Feb. 24, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 726,587
Int. Cl.² B29D *23/20*
U.S. Cl. 264—24 **25 Claims**



1. The method of forming a unitary thermoplastic container shell having a thin walled portion and a thicker walled portion comprising the steps of:

a. forming a core having a plurality of surface increasing extensions thereon;

b. applying a thermoplastic coating to said core to form a thin walled container shell;

c. curing said coating;

d. removing said container shell from said core;

e. placing said container shell on a shell supporting mandrel;

f. heating the portion of said container shell formed over said core surface increasing extensions to its plastic flow temperature; and,

g. compressing the said portion of said container shell formed over said core surface increasing extensions into a thickened wall portion of said container.

4,061,703

METHOD OF PATCHING VOIDS IN A SEMI-CONDUCTIVE COMPONENT OF INSULATED ELECTRIC CABLE, AND COMPOUND THEREFOR

Sidney Rothenberg, Fairfield, and Joseph Edward Vostovich, Bridgeport, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed May 16, 1974, Ser. No. 470,399
Int. Cl.² B29H 5/01
U.S. Cl. 264—36 15 Claims

1. A method of patching voids in a body of a semiconductive component of an insulated electrical cable, comprising the steps of filling a void in a semiconductive body with a curable semiconductive polymeric compound consisting essentially of chlorosulfonated polyethylene, conductive filler material, and lauroyl peroxide in an amount of about 2 to about 8 parts by weight per 100 parts by weight of the chlorosulfonated polyethylene, and heating the curable semiconductive polymeric composition to a temperature of at least about 200° F.

4,061,704

TERTIARY-ALKYLPEROXY ALKYL CARBONATE INITIATORS FOR HOT AIR VULCANIZATION OF SILICONE RUBBER

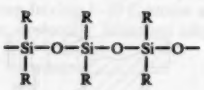
James A. Barter, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 18, 1975, Ser. No. 597,123
Int. Cl.² B29H 5/01
U.S. Cl. 264—83 10 Claims

1. A method of vulcanizing a silicone rubber composition which comprises:

a. preparing a heat-vulcanizable composition comprising

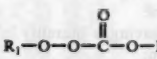
i. 100 parts of organopolysiloxane polymer gum curable to an elastomeric state and represented by the formula



wherein:

R is selected independently from the group consisting of monovalent hydrocarbon groups, monovalent halogenated hydrocarbon groups, and monovalent cyanoalkyl groups, and

ii. in a minor amount between about 0.1 and 10 parts per 100 parts of organopolysiloxane polymer sufficient to provide complete surface cure, a tertiary-alkylperoxy alkyl carbonate cure initiator represented by the formula



wherein:

R_1 is a tertiary alkyl group having 4 to 14 carbons and R_2 is an alkyl group having 8 to 26 carbons;

b. shaping heat-vulcanizable composition to form an article having a surface; and

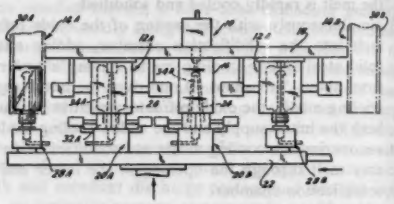
c. contacting at least a part of the surface of the article with a heated gas for between about 1 and 120 seconds at a temperature above about 315° C. and at about atmospheric pressure or below in order to cure the article to an elastomeric state and to provide a complete surface cure.

4,061,705

INJECTION BLOW MOLDING PROCESS

Paul Marcus, 85 Pascack Road, Pearl River, N.Y. 10965

Division of Ser. No. 551,274, Feb. 20, 1975, abandoned, and a continuation-in-part of Ser. No. 558,819, March 16, 1975, Pat. No. 3,990,826, which is a continuation of Ser. No. 318,703, Dec. 27, 1973, abandoned, which is a division of Ser. No. 158,161, June 30, 1971, Pat. No. 3,776,991. This application Feb. 23, 1976, Ser. No. 660,706
Int. Cl.² B29C 17/07; B29D 9/04
U.S. Cl. 264—89 19 Claims



1. A method of injection blow molding a selected oriented finished product on a single injection blow molding machine having at least two core rods, including a first temperature controlled core rod and a second blow core rod, comprising the steps of:

injection molding a parison at an injection molding station about the first core rod into a selected configuration;

conditioning the parison to orientation temperature with the first core rod while at the injection molding station and during transferring thereof to a blow molding station;

transferring the parison while it is on the first core rod to the blow molding station;

removing the parison from the first core rod and associating it with the second core rod at the blowing station;

while the parison is at orientation temperature, blowing the parison by utilization of the second core rod into the configuration of the finished product; and

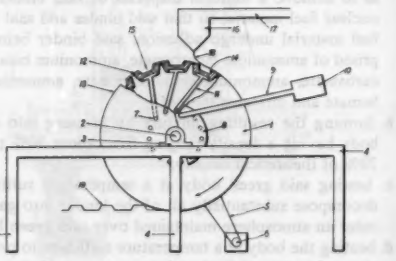
removing the oriented finished product.

4,061,706

PROCESS FOR THE CONTINUOUS MELT THERMOFORMING OF POLYMERS

Peter Roe Duffield, Toronto; Peter Robin Flockton, St. Lambert; Rupert Martin Lillis, Glen Burnie; Brian Maurice Turner, Sarnia, and Donald Edward Crowell, Kingston, all of Canada, assignors to Du Pont of Canada Limited, Montreal, Canada

Continuation of Ser. No. 443,343, Feb. 19, 1974, abandoned. This application Oct. 22, 1975, Ser. No. 624,972
Claims priority, application Canada, Feb. 28, 1973, 164867
Int. Cl.² B29C 17/04
U.S. Cl. 264—90 20 Claims



1. A process for the continuous melt thermoforming of articles of substantially uniform thickness derived from a ther-

moplastic polymer of low zero shear viscosity comprising the steps of:

a. extruding a flat web of molten polymer in a downward direction and directly over a series of mould cavities formed by a mould surface in a mould block moving at a predetermined speed, and sequentially covering said mould cavities with said flat web,

b. applying a vacuum to the mould cavities sufficient to cause the web of molten polymer to contact the surface of the mould cavity, said mould block having a lower surface and being constructed substantially entirely from porous sintered metal whereby said vacuum is uniformly transmitted between said lower surface and said mould cavities in said mould surface.

c. cooling the polymer in said cavities,

d. maintaining substantially uniform thickness of the articles by controlling the extrusion of the flat web of polymer, the application of vacuum, the contacting of the web of molten polymer with the mould cavities and the speed at which the mould cavities move, and

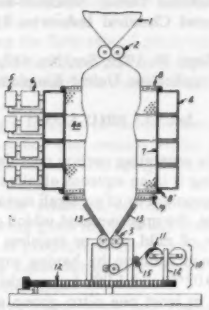
e. removing the articles.

4,061,707

PROCESS AND APPARATUS FOR HEAT SETTING BIAXIALLY ORIENTED TUBULAR POLYETHYLENE TEREPHTHALATE FILMS

Ryota Nohtomi; Masayoshi Sugiyama, and Tuyoshi Shigeyoshi, all of Fuji, Japan, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 6, 1975, Ser. No. 619,818
Claims priority, application Japan, Oct. 8, 1974, 49-115198
Int. Cl.² B29C *25/00*
U.S. Cl. 264—95 **5 Claims**



1. In the process for producing polyethylene terephthalate film which comprises a step for heat setting a tubular biaxially oriented polyethylene terephthalate film by continuously heating a film bubble expanded by a gas pressure, the improvement comprising:

a. heat setting said film in a chamber by blowing hot gaseous blasts against the exterior surface of said film bubble; wherein the temperature of the hot blasts is about 220° C.–240° C. along the first 1/5-⅓ of the chamber and wherein the temperature of the blasts thereafter declines to about 195° C.–215° C. at the final stage of heat setting, and

b. reducing the diameter of the tubular film during heat setting by about 5%–15% of that before heat setting and stretching the length thereof by about 2%–7% of that before heating;

wherein sway of the film is eliminated during heat setting.

4,061,708

STABILIZED POLYAMIDES

Stanley David Lazarus, Petersburg, and Julian Harold Newland, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Jan. 10, 1977, Ser. No. 758,258
Int. Cl.² C08K *5/56*
U.S. Cl. 264—211 **1 Claim**

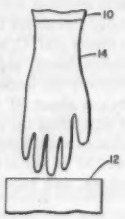
1. In a process of melt-spinning yarn from a synthetic polyamide having a relative viscosity of at least 60, the improvement which consists of incorporating in said polyamide a stabilizing amount of a copper compound selected from the group consisting of copper II dichloro bis(pyridine) and copper II dichloro bis(quinoline), said process being further characterized in that said copper compound is incorporated in said polyamide when said polyamide is in the molten state immediately prior to spinning, by forming a stable dispersion comprising a liquid polyisobutene and said copper compound and injecting the dispersion with mixing into said molten polyamide, said liquid polyisobutene having a viscosity of 3 to 70 poise at 20° C., and said dispersion containing 10 to 60 weight percent of said copper compound.

4,061,709

MANUFACTURING TEXTURED GLOVES OF SILICONE RUBBER

Carl W. Miller, Bay City; Lester C. Vandenberg, Midland, and Wayne H. Statt, Saginaw, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed June 25, 1975, Ser. No. 590,347
Int. Cl.² B29C *13/00*
U.S. Cl. 264—293 **4 Claims**



1. In a method of manufacturing textured gloves by repeatedly dipping a glove form into a solvent dispersion of uncured silicone rubber to build up a plurality of layers thereon, followed by drying and curing the silicone rubber layers to form a glove, the additional step, prior to curing the layers, of exposing the uncured solvent-containing surface of the last layer of silicone rubber to a wet atmosphere as the solvent evaporates until a fine non-coalescing layer of fluid particles has been deposited over the surface of the last layer, the atmosphere being chosen so that the fluid particles have the same or greater heat of vaporization than said solvent whereby a texturized surface effect is produced.

4,061,710

MOLDED ARTICLES

Werner Schäfer, Diedenbergen; Wolfram Busch, Massenheim-Gartenstadt; Hermann Wallhäusser, Taunusstein-Wehen; Manfred Richter, and Siegfried Wilhelm, both of Wiesbaden, all of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 10, 1975, Ser. No. 585,619
Claims priority, application Germany, June 14, 1974, 2428629
Int. Cl.² B29G *3/00*; C08G *12/32*
U.S. Cl. 264—300 **13 Claims**

1. A moulding composition comprising (a) a non-modified, unetherified melamine-formaldehyde resin having a molar

ratio of melamine to formaldehyde in the range 1:1.5 to 1:2.5 which upon hardening is capable of withstanding heating at 200° C for 2 hours in air without causing significant structural damage or color change to moulded articles made from moulding compositions in which it has been incorporated, (b) a latent accelerator being a reaction product of melamine with at least one component selected from the group consisting of (1) an at most olefinically unsaturated at most dibasic carboxylic acid and (2) an organic sulfonic acid, (c) an inorganic filler having low adsorption characteristics and an oil adsorption value of 10 to 40, (d) a further inorganic filler and (e) an external lubricant comprising at least one carboxyorganosiloxane esterified with an alcohol containing up to 4 carbon atoms, the melamine-formaldehyde resin (a) being present in an amount of from 25 to 60% by weight, the accelerator (b) being present in an amount of from 0.01 to 2% by weight, the total amount of inorganic fillers (c) and (d) being at most 65% by weight, the weight ratio of filler (c) to filler (d) being from 1:1 to 1:10, and the total external lubricant (e) being present in the amount of from 0.1 to 1.5% by weight, all proportions being refered to the total composition.

4,061,711
RECOVERY OF VANADIUM VALUES

Kenneth A. Morgan, Hoffman Estates, and Robert R. Frame, Glenview, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 26, 1976, Ser. No. 735,704
Int. Cl.² C01G *31/00*
U.S. Cl. 423—67 **6 Claims**

1. A process for the recovery of vanadium values from a vanadium bearing source containing metal impurities wherein the vanadium is present in the form of an oxide in its highest valence state consisting of leaching said vanadium bearing source with an ammoniacal medium wherein ammonia is present in a range of from about 1 to about 14 molar at a temperature of from about 50° to about 300° C. and a pressure of from about 1 to about 200 atmospheres, separating the resultant ammonium vanadate solution from insoluble metal impurities, cooling said solution to below about 50° C. to precipitate solid ammonium vanadate and separating the latter from the mother liquor, calcining the separated solid ammonium vanadate at a temperature of from about 250° to about 600° C. to convert the same to vanadium pentoxide, and recovering said vanadium pentoxide.

4,061,712
RECOVERY OF VANADIUM VALUES

Kenneth A. Morgan, Hoffman Estates, Ill., and Marilyn Miller, Tucson, Ariz., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 26, 1976, Ser. No. 735,703
Int. Cl.² C01G *31/00*
U.S. Cl. 423—67 **11 Claims**

1. A process for the recovery of vanadium values from a vanadium bearing source consisting of the steps of:

a. leaching the vanadium bearing source with caustic solution;
b. separating the pregnant leach liquor from insoluble tailings;
c. treating said pregnant leach liquor with ammonia and carbon dioxide at a pH in the range of from about 6.0 to about 9.0 thereby precipitating insoluble ammonium vanadates therefrom;
d. separating the precipitated insoluble ammonium vanadates grom caustic solution, ammonium compounds and soluble vanadates;
e. stripping said caustic solution with steam to remove ammonia;
f. supplying the resultant vaporous mixture of steam and ammonia to step (c) for contact therein with said pregnant leach liquor;
g. recycling stripped caustic solution from stripping step (e) to leaching step (a); and
h. calcining said precipitated insoluble ammonium vanadates to produce vanadium oxide therefrom.

4,061,713
PURIFICATION OF EXHAUST GASES

Guenter Weidenbach, Hannover, Germany; André Lecloux, and Yves Gobillon, both of Brussels, Belgium, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Aug. 30, 1976, Ser. No. 718,512
Claims priority, application Germany, Aug. 30, 1975, 2538706
Int. Cl.² B01D *53/34*
U.S. Cl. 423—213.5 **8 Claims**

1. In a process for purifying exhaust gases from an internal combustion engine being operated with a substantially stoichiometric fuel-to-air mixture, said exhaust gases containing hydrocarbons (C_nH_{2n+2}), carbon monoxide and nitric oxide and having an L-value of between about 0.8 and 1.2 where

$$L = \frac{[O_2] + 0.5\,[NO]}{0.5\,[CO] + 0.5\,[H_2] + \frac{6n+2}{4}\,[C_nH_{2n+2}]}$$

and n is an integer, comprising the step of contacting said exhaust gases at an elevated temperature with a catalyst supported on a carrier which has been calcined at a temperature of at least about 800° C, whereby said hydrocarbons, carbon monoxide and nitric oxide are simultaneously removed from said exhaust gases, the improvement comprising said catalyst essentially consisting of said carrier having distributed thereon a mixture from about 0.01 to 0.1% by weight each of molybdenum and rhodium and from 0 to about 0.1% by weight of platinum.

4,061,714
PROCESS FOR SEPARATING AN ACID FROM A GASEOUS MIXTURE

Mervyn Edward Dennant Turner, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sept. 29, 1975, Ser. No. 617,402
Claims priority, application United Kingdom, Oct. 14, 1974, 44408/74
Int. Cl.² B01D *53/34*
U.S. Cl. 423—220 **8 Claims**

1. In a process for separating carbon dioxide from a gaseous mixture by absorbing it in an aqueous alkaline absorbing solution of a salt of ammonium or of an alkali metal and regenerating the said solution, the improvement which comprises inhibiting the corrosion of mild steel or stainless steel surface in contact with the said solution by having present therein an amount between 0.02% and 1.0% by weight of an aromatic compound having at least one nitro group and at least one hydroxyl group substituted in the same benzene nucleus or a compound formed from the said aromatic compound in the solution and an amount sufficient to activate absorption of an activator selected from the group consisting of arsenite ions, arsenate ions, monoethanolamine, diethanolamine, ethylamino ethanol, glycine, N-ethyl-β-alanine and N-ethyl glycine.

4,061,715
PROCESS FOR CONVERSION OF ALKALINE EARTH SULFITES AND BISULFITES INTO OXIDES AND CARBONATES

Salvatore A. Guerrieri, 503 Beverly Road, Newark, Del. 19711

Filed July 5, 1974, Ser. No. 485,918
Int. Cl.² C01B *17/00*; C01F *1/00, 5/24*; C01B *13/14*
U.S. Cl. 423—242 **10 Claims**

1. A process for treating an alkaline earth metal sulfite or bisulfite selected from the group consisting of the sulfite or bisulfite of calcium and magnesium in particulate form to recover the alkaline earth metal values thereof in the form of

an alkaline earth metal oxide which comprises: contacting said alkaline earth metal sulfite with a gaseous stream including hydrogen and water vapor at a temperature of from 450° to 1000° C.

4,061,716

PROCESS FOR THE PRODUCTION OF SORBENT SOLIDS FOR USE IN THE DESULFURIZATION OF GASES

Patrick John McGauley, 7 Plymouth Road, Port Washington, N.Y. 11050

Continuation-in-part of Ser. No. 509,781, Sept. 27, 1974, abandoned, which is a continuation-in-part of Ser. No. 403,950, Oct. 5, 1973, abandoned. This application June 18, 1976, Ser. No. 697,384

Int. Cl.² C01B *17/60*

U.S. Cl. 423—244 16 Claims

1. A process for the preparation and utilization of sorbent solids having particular utility in reducing the sulfur compound content of combustion gases and reducing gases, which comprises the steps of:

a. mixing (i) finely divided solids containing a compound, selected from the group consisting of iron and calcium compounds, as an active component, with (ii) a liquid selected from the group consisting of water, sulfuric acid, and solutions containing sulfuric acid to produce agglomerated particles of moist solids that contain water soluble and reversibly hydratable compounds, which solids are essentially free of individual particles smaller than ten microns in diameter,

b. drying the above agglomerated moist solids by contact with relatively sulfur-free gases in a fluid bed drier, at temperatures between 80° and 300° C., to remove the water therefrom and thereby to produce porous dry solids containing agglomerated particles high in surface area and to cure water soluble and reversibly hydratable compounds and thereby to produce particles high in mechanical strength,

c. modulating the flow rate of gas in contact with the above solids to elutriate from the fluid bed of the drier, a major fraction of the particles smaller than about 200 microns in diameter,

d. collecting a fraction of the classified, porous, agglomerated, dry solids that remain in the bed of the drier, as product of the sorbent preparation procedures of the process,

e. utilizing the collected sorbent solids by contact with sulfur-bearing gases in gas-solids contacting equipment to generate, as products of the process, spent sorbent solids containing sulfur compounds, and a gas reduced in content of sulfur, and

f. repetitively regenerating and reusing at least a major fraction of said spent solids.

4,061,717

DIRECTED CRYSTALLIZATION OF SYNTHETIC ALUMINOSILICATES

George T. Kerr, Lawrenceville, and Louis D. Rollmann, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 511,902, Oct. 3, 1974, abandoned. This application June 18, 1976, Ser. No. 697,646

Int. Cl.² C01B *33/28*

U.S. Cl. 423—329 20 Claims

1. A process of synthesising a crystalline aluminosilicate zeolite from an aqueous reaction mixture containing sources of silicate, of aluminate and of cations in quantity at least equivalent to the aluminum in said mixture, characterized by the fact that said source of cations comprises a polymer selected from ionenes and ionomers of such equivalent weight, and in such quantity, as to balance the negative charge on 1 to 100 percent of the aluminum-containing tetrahedra of the resulting zeolite with positively charged polymer nitrogen atoms.

4,061,718

METHOD FOR THE RECOVERY OF AMMONIA FROM LIQUOR FROM THE FILTERS OF AMMONIA-SODA PLANTS

Jean Verlaeten, and Paul Demilie, both of Brussels, Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Nov. 5, 1975, Ser. No. 628,960

Claims priority, application France, Nov. 9, 1974, 74.37846

Int. Cl.² C01C *1/02*

U.S. Cl. 423—356 8 Claims

1. In a method for the recovery of ammonia from liquor from filters of ammonia-soda plants which contains free ammonia and ammonium chloride, wherein the liquor is heated and traversed by a current of steam in a heating column to release more particularly the free ammonia, then is treated in a prelimer with a basic agent in an amount sufficient to decompose the major part but not the whole of the ammonium chloride with liberation of ammonia and is finally treated with steam so as to entrain liberated gaseous products in a still where there also is introduced the balance of basic agent needed to decompose the whole of the ammonium chloride, the improvement wherein: prelimer is lime, the balance used in the still is an alkali metal hydroxide, and the amount of alkali metal hydroxide added is controlled in response to the presence of ammonium ions in the still outlet so as to minimize said amount of alkali metal hydroxide added.

4,061,719

PROCESS OF CONDUCTIVE CARBON BLACK FOR USE IN DEPOLARIZATION MASSES IN DRY BATTERIES

Erich Schallus, Cologne; Gerhard Mietens, Hurth; Gregor Fucker, Erftstadt-Liblar; Jürgen Petrell, Weilerswist, and Friedrich Wilhelm Dorn, Hurth-Hermulheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 7, 1976, Ser. No. 674,575

Claims priority, application Germany, Apr. 10, 1975, 2515633

Int. Cl.² C01B *31/00, 31/02;* C09C *1/48*

U.S. Cl. 423—445 8 Claims

1. A process for making conductive carbon black for use in depolarization masses in dry batteries, which comprises intimately mixing an aqueous suspension of carbon black having an AS-number higher than 15 and having been obtained by subjecting hydrocarbons, which are liquid at room temperature, to thermal conversion at temperatures of 1200° up to 2000° C, under pressures of 1 up to 80 atmospheres, and in the presence of oxygen or oxygen-containing gases, and water-scrubbing the resulting carbon black-containing reaction gas, with 0.5 up to 10 g, per gram of carbon black, of vaporizable aliphatic or cycloaliphatic hydrocarbons having a boiling range of 25° up to 100° C, the mixing operation being effected at temperatures of 5° up to 120° C, under pressures of 1 up to 20 atmospheres, in liquid phase, and for a period of 1 up to 20 minutes, separating the resulting carbon black from the liquid phase, heating and thereby freeing the carbon black from hydrocarbons and water, and increasing the temperature over a period of 2 up to 30 minutes to 1100° up to 2200° C.

4,061,720

PREPARATION OF AMMONIUM AND POTASSIUM ZIRCONIUM CARBONATES

Raymond Francis Phillips, Cheadle Holme, England, assignor to Magnesium Elektron Limited, Switon, England

Continuation of Ser. No. 297,415, Oct. 13, 1972, abandoned. This application Oct. 20, 1975, Ser. No. 623,992

Int. Cl.² C01G *25/00*

U.S. Cl. 423—265 5 Claims

1. In an aqueous solution of ammonium zirconium carbonate, the improvement wherein said solution

a. contains 18–25% by weight of zirconium expressed as zirconium dioxide;
b. has a molar ratio of carbonate to zirconium not greater than 2.05;
c. is capable of imparting thixotropic properties to aqueous dispersions of polymers and copolymes when mixed therewith; and
d. is stable for at least 10 hours at a temperature of 60° C.

2. A solution as claimed in claim 1 which is further stabilized by the addition of a compound selected from tartaric and gluconic acid.

4,061,721
HYDROGEN PEROXIDE STABILIZATION WITH PHENYLPHOSPHONIC ACIDS

W. Albert Strong, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 28, 1975, Ser. No. 636,322
Int. Cl.[2] C01B *15/02*
U.S. Cl. 423—272 10 Claims

1. A stabilized aqueous hydrogen peroxide solution containing a minor stabilizing concentration, sufficient to inhibit decomposition of hydrogen peroxide induced by polyvalent metal cation contamination, of soluble stabilizer selected from the group consisting of phenylphosphonic acids having 0 to 3 lower alkyl substituents on the phenyl group, and alkali metal and ammonium salts thereof.

6. A method of stabilizing aqueous hydrogen peroxide which comprises:

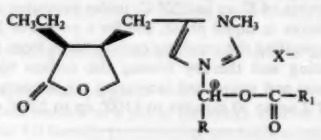
adding to an aqueous hydrogen peroxide solution a minor stabilizing amount, sufficient to inhibit decomposition of hydrogen peroxide induced by polyvalent metal cation contamination, of soluble stabilizer selected from the group consisting of phenylphosphonic acids having 0 to 3 lower alkyl substituents on the phenyl group, and alkali metal and ammonium salts thereof.

4,061,722
SELECTED QUATERNARY AMMONIUM SALTS OF PILOCARPINE USEFUL IN REDUCING INTRAOCULAR PRESSURE IN WARM-BLOODED ANIMALS

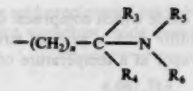
Nicolae S. Bodor, Lawrence, Kans., assignor to INTERx Research Corporation, Lawrence, Kans.

Filed Apr. 26, 1976, Ser. No. 680,437
Int. Cl.[2] A61K *31/415*; C07D *233/64*
U.S. Cl. 424—273 R 17 Claims

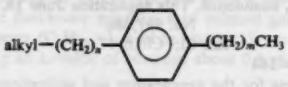
1. A method for reducing intracular pressure in a warm-blooded animal in need of said response which comprises topically administering to the ophthalmic membrane thereof, an effective amount of a compound having the formula:



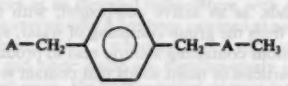
wherein R represents a member selected from the group consisting of a hydrogen atom, a C_1-C_{20} open chain or cyclo alkyl group, a C_1-C_{20} alkoxyalkyl group, a C_1-C_{20} alkanoyloxyalkyl group, a C_1-C_{20} haloalkyl group, a C_1-C_{20} carboxyalkyl group, a phenyl group, a naphthyl group and a substituted phenyl or naphthyl group whose substituents are selected from the group consisting of a halogen atom, an O-C_1-C_4 alkyl group, an O-C_1-C_8 alkanoyl group, a nitro group, a carboxyl group, and a carboethoxy group; wherein R_1 represents a C_9-C_{22} straight or branched alkyl group,



group, wherein R_3, R_4,R_5 and R_6 are each selected from the group consisting of a hydrogen atom, a methyl group, or an ethyl group, and wherein R_1 further represents a member selected from the group consisting of a C_9-O_{22} straight or branched



group, wherein *n* in each occurrence and *m* represent an integer of from 0 to 22, and an



group, wherein A represents a $-(CH_2CH_2O)_p$ group, wherein the *p* represents an integer of from 0 to 22 and a cholic acid residue; and wherein X represents a member selected from the group consisting of a halogen atom, a methanesulfonate group, a fluorosulfonate group and a tosylate group.

4,061,723
PROCESS FOR PREPARING CONCENTRATED TETRAFLUOROBORIC ACID

Manfred Feser, Frankfurt am Main; Egon Joerchel, Hochheim, Main, and Jürgen Korinth, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 12, 1976, Ser. No. 741,399
Claims priority, application Germany, Nov. 15, 1975, 2551433
Int. Cl.[2] C01B *35/06*
U.S. Cl. 423—276 10 Claims

1. A process for the preparation of tetrafluoroboric acid which comprises bringing a gas containing hydrogen fluoride into contact with a solid boron/oxygen compound to form concentrated tetrafluoroboric acid and separating said tetrafluoroboric acid from said solid boron/oxygen compound.

4,061,724
CRYSTALLINE SILICA

Robert William Grose, Mahopac, and Edith Marie Flanigen, White Plains, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,557
Int. Cl.[2] C01B *33/12*
U.S. Cl. 423—335 2 Claims

1. A silica polymorph consisting of crystalline silica, said silica polymorph after calcination in air at 600° C for 1 hour, having a mean refractive index of 1.39 ± 0.01 and a specific gravity at 25° C of 1.70 ± 0.05 g./cc.

4,061,725

MANUFACTURE OF GAMMA-IRON(III) OXIDE

Manfred Ohlinger, Frankenthal; Eduard Schoenafinger, Ludwigshafen; Walter Schneider, Ludwigshafen; Heinz Stritzinger, Ludwigshafen, and Guenter Vaeth, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 15, 1976, Ser. No. 732,899

Claims priority, application Germany, Nov. 8, 1975, 2550307

Int. Cl.² C01G *49/02*

U.S. Cl. 423—634 7 Claims

1. In a process for the manufacture of acicular γ-iron(III) oxide wherein an aqueous solution of an iron(II) salt is reacted with an aqueous solution of an alkali metal hydroxide, the resulting suspensions of iron(II) hydroxide are oxidized with oxygen or oxygen-containing gases to goethite, the resulting goethite is reduced to magnetite and the magnetite is oxidized to acicular γ-iron(III) oxide, the improvement comprising: carrying out the oxidation of the iron(II) hydroxide suspension in three stages, wherein in a first stage from 0.1 to 4% by weight of the iron(II) present in the suspension is oxidized over a period of from 0.1 to 4 hours; in a second stage from 10 to 25% by weight of the iron(II) hydroxide originally present in the suspension is oxidized over an additional period of 1.5 to 6 hours by introducing at the beginning of said second stage from 0.04 to 0.1 mole per hour of oxygen/gram atom of the iron contained in the suspension and gradually increasing the introduction of oxygen during said second stage up to 0.1 to 0.25 mole per hour of O_2/g atom of iron at the end thereof; and in a third stage oxidizing the remaining iron(II) by introducing 0.3 to 0.8 moles of oxygen per hour per gram atom of iron contained in the suspension.

4,061,726

MANUFACTURE OF ACICULAR γ-IRON(III) OXIDE

Manfred Ohlinger, Frankenthal; Eduard Schoenafinger, Ludwigshafen; Guenter Vaeth, Limburgerhof; Heinz Stritzinger, Ludwigshafen; Eberhard Koester, Frankenthal; Hans Henning Schneehage, and Werner Steck, both of Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 15, 1976, Ser. No. 732,901

Claims priority, application Germany, Nov. 8, 1975, 2550308

Int. Cl.² C01G *49/02*

U.S. Cl. 423—634 6 Claims

1. In a process for manufacturing acicular γ-iron(II) oxide wherein an aqueous solution of an iron(II) salt is reacted with an aqueous solution of an alkali metal hydroxide and the resulting suspension of iron(II) hydroxide is oxidized with oxygen or oxygen-containing gases to give goethite, reducing the resulting goethite to magnetite and oxidizing the magnetite to acicular γ-iron(III) oxide, the improvement comprising: carrying out the oxidation of the iron(II) hydroxide suspension in three stages wherein in a first stage from 4 to 15% by weight of the amount of iron(II) present is oxidized in the course of from 0.4 to 5 hours, in a second stage from 60 to 85% by weight of the amount of iron(II) originally present in the suspension is oxidized over an additional period of from 1.5 to 6 hours by introducing 0.3 to 0.9 moles per hour of oxygen/gram atom of the iron contained in the suspension at the beginning of said second stage and gradually increasing the supply of oxygen during said second stage up to 0.7 to 1.5 moles per hour of oxygen/gram atom of iron at the end thereof; and in a third stage oxidizing the remaining iron(II) by introducing 1.5 to 2.5 moles of oxygen per hour per gram atom of iron contained in the suspension.

4,061,727

MANUFACTURE OF γ-IRON(III) OXIDE

Guenter Vaeth, Limburgerhof; Manfred Ohlinger, Frankenthal; Heinz Stritzinger; Eduard Schoenafinger, both of Ludwigshafen; Eugen Wettstein, Germersheim, and Wolfgang Guth, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 15, 1976, Ser. No. 732,909

Claims priority, application Germany, Nov. 8, 1975, 2550225

Int. Cl.² C01G *49/02*

U.S. Cl. 423—634 8 Claims

1. In a process for the manufacture of acicular γ-iron(III) oxide by reacting an aqueous solution of iron(II) salt with aqueous solutions of alkali metal hydroxides, oxidizing the resulting suspensions of iron(II) hydroxide with oxygen or oxygen-containing gases to goethite, reducing the resulting goethite to magnetite and oxidizing the magnetite to acicular γ-iron(III) oxide, the improvement comprising: carrying out the oxidation of the iron(II) hydroxide suspension in three stages, wherein in the first stage not more than 8% by weight of the iron(II) present is oxidized over a period of from 0.5 to 4 hours in the first stage, in the second stage from 25 to 55% of the iron(II) originally present in the suspension is oxidized over an additional period of 1.5 to 6 hours by introducing 0.1 to 0.4 mole per hour of oxygen/gram atom of the iron contained in the suspension at the beginning of said second stage and gradually increasing the introduction of oxygen during said second stage up to 0.2 to 0.9 mole per hour of O_2/g atom of iron at the end thereof and in the third stage oxidizing the remaining iron(II) by introducing 1 to 2 moles of oxygen per hour per gram atom of iron contained in the suspension.

4,061,728

THERAPEUTIC COMPOSITION IN SUBSTANTIALLY RIGID BLOCK FORM FOR USE IN CONTROLLING OR PREVENTING BLOAT IN ANIMALS

Clifford Arthur Andrew Graham, Nunawading, and Kevin Lawrence Linehan, Burwood East, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Continuation of Ser. No. 489,437, July 17, 1974, Pat. No. 4,005,192. This application Sept. 27, 1976, Ser. No. 726,431

Claims priority, application Australia, July 27, 1973, 4265/73

The portion of the term of this patent subsequent to Jan. 25, 1994, has been disclaimed.

Int. Cl.² A61K *9/00, 31/74, 33/08*

U.S. Cl. 424—14 5 Claims

1. A therapeutic composition of matter in the form of a substantially rigid block for use in controlling or preventing bloat in animals, said composition comprising an effective amount of the product obtained by reacting together molasses, magnesium oxide, and a nonionic polyoxyalkylene surface active compound so as to obtain the reaction mixture in substantially rigid form, the surface active compound being one of formula

$$R^1\text{-}O\text{-}(CH_2CH_2\text{-}O)_n\text{-}H$$

wherein R^1 is a linear $C_{9\text{-}18}$alkyl group and *n* lies in the range 10 to 30 inclusive.

4,061,729

PROSTANOIC ACID DERIVATIVES AND THERAPEUTIC COMPOSITIONS

Jacques Martel, Bondy; Jean Buendia, Nogent-sur-Marne, and Michel Vivat, Lagny-sur-Marne, all of France, assignors to Roussel Uclaf, Paris, France

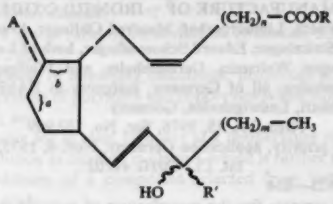
Continuation-in-part of Ser. No. 425,794, Dec. 18, 1973. This application June 17, 1975, Ser. No. 587,558

Claims priority, application France, June 21, 1974, 74.21602; Dec. 27, 1972, 72.46324

Int. Cl.² C07C *177/00;* A61K *31/19, 31/215*

U.S. Cl. 424—305 9 Claims

1. A compound of the formula



wherein R is a member selected from the group consisting of H, lower alkyl having 1 to 4 carbon atoms and acid salts of pharmaceutically compatible bases, *m* is an integer 3,4 or 5, *n* is an integer 2,3 or 4, R′ is a member selected from the group consisting of alkenyl of 2 to 4 carbon atoms and cycloalkenyl of 3 to 6 carbon atoms, A is a member selected from the group consisting of ketonic oxygen and alkoxy of 1 to 4 carbon atoms, one of *a* or *b* being double bond when A is alkoxy, the dotted line to A being a double bond when A is a ketonic oxygen, and the wavy lines represent a paired configuration selected from the group consisting of α,β and β,α and mixtures thereof.

4,061,730

ANTI-SOLAR AGENT AND COMPOSITIONS CONTAINING THE SAME

Gregoire Kalopissis, Paris; Claude Bouillon, Eaubonne, and Charles Vayssie, Aulnay-sous-Bois, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation of Ser. No. 397,978, Sept. 17, 1973, abandoned. This application Feb. 9, 1976, Ser. No. 656,573

Claims priority, application Luxembourg, Sept. 25, 1972, 66156

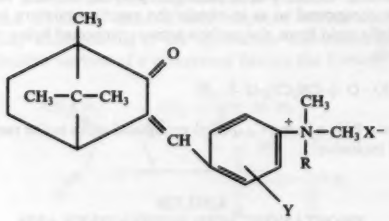
Int. Cl.² A61K *7/42*; C07C *87/68*

U.S. Cl. 424—59 **13 Claims**

1. A cosmetic composition comprising a solution of

1. a solvent which is water, lower alkanol, lower polyol or an aqueous solution of a lower alkanol

2. an antisolar agent of the formula



wherein

R is selected from the group consisting of hydrogen and alkyl containing 1–12 carbon atoms;

Y is selected from the group consisting of halogen, methyl and hydrogen; and

X is selected from the group consisting of chloride, p-toluene sulfonate, methyl bromobenzene sulfonate, methane sulfonate, camphosulfonate, methylsulfate and ethylsulfate; wherein said anti-solar agent is present in amounts of about 0.05–10 percent by weight of said composition.

4,061,731

COMPOSITIONS CONTAINING COLLAGEN AND METHODS OF USE FOR REPAIRING DEPRESSED CUTANEOUS SCARS

Sheldon K. Gottlieb, 8708 Wandering Trail Drive, Potomac, Md. 20854

Continuation-in-part of Ser. No. 576,858, June 4, 1975, Pat. No. 4,006,220. This application Jan. 31, 1977, Ser. No. 764,229

Int. Cl.² A61K *35/16, 37/02*

U.S. Cl. 424—101 **18 Claims**

1. A composition useful for the repair of depressed cutaneous scars comprising finely-divided collagen and plasma, said collagen being present in an amount effective to maintain fibrin within a cavity formed under said scar and thereby cause the build-up of new collagen within said cavity and said plasma being present in an amount to provide sufficient fibrin within said cavity.

4,061,732

CONTROL OF LACTIC ACIDOSIS IN RUMINANTS

Larry A. Muir, Flemington, and Albert Barreto, Milltown, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 668,332, March 19, 1976, abandoned, which is a continuation of Ser. No. 527,392, Nov. 26, 1974, abandoned, which is a continuation of Ser. No. 444,991, Feb. 22, 1974, abandoned. This application Nov. 8, 1976, Ser. No. 739,929

Int. Cl.² A61K *35/00*

U.S. Cl. 424—117 **12 Claims**

1. A method for the prevention of lactic acidosis in ruminants and for shortening the period of adaptation of said ruminants to a high energy feed from a low energy roughage feed wherein said low energy roughage feed has an energy content of less than 110 megacalories per 100 kg. of feed and said high energy feed has an energy content of 110 or more megacalories per 100 kg. of feed, which comprises administering to said ruminant said high energy feed and an effective amount of a sulfur-containing peptide antibiotic with a molecular weight in excess of 900.

4,061,733

VETERINARY COMPOSITIONS FOR INDUCING ESTRUS IN ANIMALS AND METHOD

Narayan Vishwanath Gunjikar, Botawala Building, 21, Sitaladevi Temple Road, Bombay, India (400016)

Filed Oct. 15, 1976, Ser. No. 732,778

Int. Cl.² A61K *33/34, 31/135*

U.S. Cl. 424—143 **9 Claims**

1. A veterinary composition for inducing estrus in animals comprising an estrus effective amount of a homogeneous mixture of non-toxic, veterinary acceptable acid addition salts of cis-clomiphene and trans-clomiphene in a weight ratio of approximately 3:2 and a carrier.

4,061,734

METHOD OF THERAPEUTICALLY TREATING WARM BLOODED ANIMALS AND COMPOSITIONS THEREFOR

John Wesley Willard, Rapid City, S. Dak., assignor to CAW Industries, Inc., Rapid City, S. Dak.

Continuation-in-part of Ser. No. 712,158, Aug. 6, 1976, Pat. No. 4,029,770, and Ser. No. 593,712, July 7, 1975, which is a continuation-in-part of Ser. No. 317,097, Dec. 20, 1972, Pat. No. 3,893,943, which is a continuation of Ser. No. 108,198, Jan. 20, 1971, abandoned, said Ser. No. 712,158, is a division of Ser. No. 455,022, March 26, 1974, Pat. No. 3,984,540. This application Oct. 18, 1976, Ser. No. 733,049

Int. Cl.² A61K *33/12, 33/06, 35/78*

U.S. Cl. 424—155 **54 Claims**

1. A therapeutic composition for treating warm blooded animals having damaged or infected tissue which responds to treatment with an antibiotic comprising a therapeutically effec-

tive amount of an antibiotic which is therapeutically effective in treating the said damaged or infected tissue, a catalytically effective amount of a catalyst, and a therapeutically effective amount of water soluble catalyst treated lignite;

the said catalyst being prepared by a process comprising

admixing a water soluble alkali metal silicate with an aqueous medium containing a dissolved substance which is a source of calcium ion and a dissolved substance which is a source of magnesium ion;

the aqueous medium containing said dissolved substances in amounts to provide between about 1×10^{-4} and 1×10^{-1} mole per liter each of calcium ion and magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide a molar ratio of calcium ion to magnesium ion between about 2.0:1.0 and 1.0:2.0,

the alkali metal silicate having an alkali metal oxide to silicon dioxide ratio between about 0.9:1.0 and less than 2.0:1.0 and being admixed with the aqueous medium in an amount of about 0.05–2 moles per liter,

reacting the alkali metal silicate with said dissolved substances providing calcium ion and magnesium ion to produce an aqueous suspension of finely divided particles of the reaction product,

admixing a micelle-forming surfactant with the aqueous medium in an amount to form catalyst micelles comprising said finely divided particles of the reaction product upon agitating the aqueous medium, and

agitating the aqueous medium containing the finely divided particles of the reaction product and surfactant to form said catalyst micelles; and

the said catalyst treated lignite being prepared by a process comprising intimately contacting solid lignite in particulate form with a liquid aqueous medium containing a catalytically effective amount of the said catalyst,

the said particles of the lignite having active sites therein which react with at least one component of the said aqueous medium containing the catalytically effective amount of the catalyst under liquid phase conditions and in the presence of the said catalyst, and

the said particles of the lignite being intimately contacted under liquid phase conditions until the active sites thereof react with at least one component of the said aqueous medium containing the catalytically effective amount of the catalyst and until the lignite is soluble in an aqueous medium.

4,061,735

HAPTOGLOBIN IN AQUEOUS SOLUTION AND PROCESS FOR PREPARING THE SAME

Satoshi Funakoshi, Katano; Takao Omura, Toyonaka, and Takeshi Ohshiro, Osaka, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 444,662, Feb. 21, 1974, abandoned. This application Apr. 15, 1976, Ser. No. 677,085

Claims priority, application Japan, Nov. 15, 1973, 48-128605; Nov. 15, 1973, 48-128606

Int. Cl.² A61K *37/02*

U.S. Cl. 424—177 **12 Claims**

1. An aqueous solution of human serum haptoglobin suitable for the therapy of renal disorders derived from massive hemolysis which has less than 10% in hypotensive activity, is highly stable during storage and which has been subjected to heat treatment in the presence of at least one stabilizing agent selected from the group consisting of neutral amino acids, monosaccharides, disaccharides and soluble sugar alcohols, for inactivating hepatitis B virus (HB-Ag).

4,061,736

PHARMACEUTICALLY ACCEPTABLE INTRAMOLECULARLY CROSS-LINKED, STROMAL-FREE HEMOGLOBIN

Kent C. Morris, Mountain View; Pieter Bonsen, Los Altos, both of Calif., and Myron B. Laver, Weston, Mass., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 553,514, Feb. 2, 1975, Pat. No. 4,001,401, and a continuation-in-part of Ser. No. 554,051, Feb. 2, 1975, Pat. No. 4,001,200. This application Sept. 27, 1976, Ser. No. 727,066

The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.

Int. Cl.² A61K *37/02*; C12B *3/00*; C07G *7/00*

U.S. Cl. 424—177 **22 Claims**

1. A pharmaceutical composition useful as a blood substitute and blood plasma expander comprising a therapeutically effective amount of intramolecularly cross-linked, stromal-free deoxyhemoglobin, soluble in aqueous and physiological fluids, capable of reversibly binding a ligand, having a molecular weight of about 64,500, and mixed with a pharmaceutically acceptable carrier.

4,061,737

METHOD FOR STIMULATING RELEASE OF PROLACTIN

Harvey E. Alburn, West Chester; Eric L. Lien, Paoli, and Norman H. Grant, Wynnewood, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,795

Int. Cl.² A61K *37/00*

U.S. Cl. 424—177 **3 Claims**

1. A method for stimulating prolactin release in a warm-blooded animal in which such stimulation is desirable which comprises administering to said animal by a parenteral route an effective amount of a pentapeptide of the formula:

H-Tyr-Gly-Gly-Phe-Met-OH

or

H-Tyr-Gly-Gly-Phe-Leu-OH

or a non-toxic pharmacologically acceptable salt thereof.

4,061,738

PROCESS FOR REDUCING PLATELET ADHESIVENESS

Wayne Martin, 1222 Pelham Drive, Fort Wayne, Ind. 46825

Continuation-in-part of Ser. No. 476,337, June 4, 1974, abandoned, which is a continuation of Ser. No. 249,741, May 2, 1972, abandoned, which is a continuation of Ser. No. 98,160, Dec. 14, 1970, abandoned, which is a continuation of Ser. No. 626,101, March 27, 1967, abandoned. This application Dec. 29, 1975, Ser. No. 644,812

Int. Cl.² A61K *35/78*

U.S. Cl. 424—195 **5 Claims**

1. A process for reducing platelet adhesiveness in flowing human blood which comprises orally administering to humans a platelet adhesiveness reducing amount of an edible oil obtained by

pressing flaxseeds at a temperature below about 230° F and in the absence of caustic to obtain a first major portion of flaxseed oil;

adding approximately 3% by weight, based on the weight of the flaxseed oil, of soy phosphatide obtained by centrifuging an oil obtained from soy beans and separating the soy phosphatide from the centrifuged oil;

adding approximately 3% by weight, based on the weight of the flaxseed oil, of a flax phosphatide obtained by centrifuging an oil obtained from flaxseeds and separating the flax phosphatide from the centrifuged oil; and

adding mixed grain and soya tocopherols in an amount of

less than 1% by weight based on the weight of the flaxseed oil.

4,061,739

ISOLATION OF UTERO-EVACUANT SUBSTANCES FROM PLANT EXTRACTS

Ramesh M. Kanojia, Somerville, and Seymour D. Levine, North Brunswick, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed July 7, 1976, Ser. No. 703,160
Int. Cl.² A61K *35/78*
U.S. Cl. 424—195 6 Claims

1. The method of purifying extracts containing utero-evacuant materials obtained from the zoapatle plant which comprises the steps of:

dissolving the mixture of semi-purified utero-evacuant materials in a water-immiscible organic solvent, chromatographing the resultant solution on alumina, eluting the alumina with a mixture of polar and non-polar organic solvents and collecting the fractions containing utero-evacuant materials.

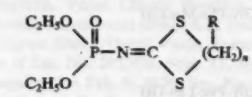
4,061,740

LIQUID COMPOSITIONS CONTAINING A POLYETHYLENE GLYCOL SAFENER AND AN ORGANOPHOSPHORUS PESTICIDE

Alfonso Boatright, Burlington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 632,942, Nov. 18, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 733,648
Int. Cl.² A01N *9/36*
U.S. Cl. 424—202 8 Claims

1. A composition comprising in combination from 95 to 30%, by weight, of a polyethylene glycol solvent of an average molecular weight of 200 to 600 and from 5 to 70%, by weight, of an agent of the formula:



where R is hydrogen or methyl and n is an integer from 1 to 2, distinguished by excellent nematocidal and insecticidal activity combined with markedly decreased mammalian dermal toxicity.

4,061,741

PHYSIOLOGICAL SUBSTANCES FOR INTENSIFYING THE PHARMACOLOGICAL EFFECT OF DRUGS

Wolfgang Wawretschek, and Lothar Wawretschek, both of Munich, Germany, assignors to Firma Servomed Arzei GmbH & Co. Pharma KG, Munich, Germany

Filed Mar. 27, 1975, Ser. No. 562,736
Claims priority, application Germany, Apr. 1, 1974, 2415740
Int. Cl.² A61K *31/625, 31/505*
U.S. Cl. 424—232 41 Claims

1. A method of treating a patient suffering from pain which comprises enterally or parenterally administering to said patient an enterally or parenterally administrable central nervous system effective analgesic composition selected from the group consisting of: (a) a composition comprising a central nervous system analgesic which exhibits in vivo and in vitro an affinity for blood proteins, and a member selected from the group consisting of orotic acid (1,2,3,6-tetrahydro-2,6-dioxo-4-pyrimidine-carboxylic acid), physiologically compatible orotic acid salts other than with said central nervous system analgesic, and mixtures thereof in an amount sufficient to increase the amount of said analgesic which is ultrafilterable from serum and to increase the analgesic efficiency of said analgesic; (b) composition comprising a physiologically compatible orotic acid salt of a central nervous system analgesic which exhibits in vivo and in vitro an affinity for blood proteins wherein the orotic acid moiety is in an amount sufficient to increase the amount of said analgesic which is ultrafilterable from serum and to increase the analgesic efficiency of said analgesic, and mixtures of (a) and (b).

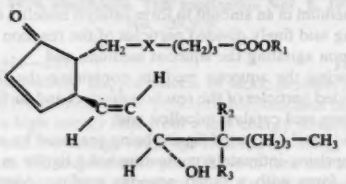
4,061,742

METHOD OF REDUCING THE UNDESIRABLE GASTROINTESTINAL EFFECTS OF PROSTAGLANDIN SYNTHETASE INHIBITORS WITH PGA COMPOUNDS

André Robert, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 437,444, Jan. 28, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,437
Int. Cl.² A61K *31/61, 31/215, 31/19*
U.S. Cl. 424—234 3 Claims

1. A method of systemic administration of an anti-inflammatory prostaglandin synthetase inhibitor to a mammal, the improvement which comprises concomitant systemic administration of (a) said inhibitor, and (b) a prostaglandin of the following formula



in an amount effective to reduce the gastrointestinal effects of the prostaglandin synthetase inhibitor where R_1 is hydrogen, or alkyl of one to 8 carbon atoms, inclusive, where R_2 is methyl or ethyl, where R_3 is hydrogen, methyl or ethyl, and where X is —CH_2CH_2— or cis—CH=CH— or a pharmaceutically acceptable salt thereof when R_1 is hydrogen.

4,061,743

EXHAUST GAS SCRUBBING PROCESS

Teizo Senjo, Machida, and Makio Kobayashi, Toyonaka, both of Japan, assignors to Fuji Kasui Engineering Co., Ltd., Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of Japan

Filed Apr. 23, 1976, Ser. No. 679,777
Claims priority, application Japan, May 6, 1975, 50-53150; May 6, 1975, 50-53151; Jan. 7, 1976, 51-001200
The portion of the term of this patent subsequent to July 12, 1994, has been disclaimed.
Int. Cl.² C01B *21/00, 17/00*
U.S. Cl. 423—235 10 Claims

1. A process for removing nitrogen oxides including nitrogen monoxide and nitrogen dioxide from exhaust gas containing the same comprising the steps of:

a. oxidizing the nitrogen monoxide into nitrogen dioxide, dinitrogen trioxide or a mixture thereof by adding an oxidizing agent to the exhaust gas, and; then,

b. contacting, in a scrubbing column, the gas with an aqueous scrubbing suspension having a pH of not less than 4.5 and containing (i) the sulfite of at least one alkaline earth metal, (ii) not less than 0.03 mol/liter of thiourea or thiosulfate of alkali metals, alkaline earth metals and ammonium or mixtures thereof and (iii) not less than 0.003 mol/liter of copper ion or iron ion or a mixture thereof, whereby the nitrogen oxides are reduced to nitrogen.

4,061,744

STABLE PREPARATION OF WATER-SOLUBLE SALTS OF DEHYDROEPIANDROSTERONE SULFATE FOR PARENTERAL ADMINISTRATION

Isao Sugimoto, Nara, and Yoko Sawase, Osaka, both of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Aug. 31, 1976, Ser. No. 719,278
Claims priority, application Japan, Sept. 5, 1975, 50-108197; July 6, 1976, 51-80613
Int. Cl.² A61K *31/56*
U.S. Cl. 424—243 13 Claims

1. A method for producing a stable pharmaceutical preparation for parenteral administration which comprises dissolving a water-soluble salt of dehydroepiandrosterone sulfate in an aqueous solution of a stabilizing agent selected from the group consisting of dextran, polyethylene glycol, a neutral or basic naturally occuring amino acid, an alkali metal salt of a weak acid, tris (hydroxymethy) amindethane and mixtures thereof, and lyphilizing the resulting mixture.

4,061,745

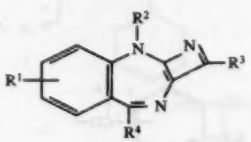
AZETO [2,3-b][1,4] BENZO DIAZEPINES

Umakant Devdas Shenoy, London, England, assignor to DDSA Pharmaceuticals Ltd., London, England

Filed May 12, 1975, Ser. No. 576,921
Claims priority, application United Kingdom, May 14, 1974, 21195/74
Int. Cl.² C07D *487/04;* A61K *31/55*
U.S. Cl. 424—244 8 Claims

1. A compound of the formula

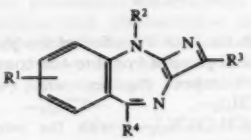
III



wherein R^1 represents hydrogen, chlorine, bromine, fluorine, iodine or nitro; R^2 represents C_1–C_{10} alkyl; R^3 represents lower alkyl group and R^4 represents phenyl; or a pharmaceutically acceptable acid addition product thereof.

2. A therapeutic composition comprising at least one compound of the formula

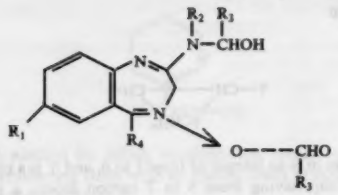
III



wherein R^1 represents hydrogen, chlorine, bromine or nitro; R^2 represents methyl or ethyl; R^3 represents lower alkyl group and R^4 represents phenyl, or a pharmaceutically acceptable acid addition salt thereof in an amount sufficient to provide a tranquilizing, sedative, or hypnotic effect in admixture with a pharmacologically acceptable diluent or carrier.

3. A process for the preparation of a compound according to claim 1 which comprises contacting a compound of the formula

I



wherein R_1, R_2, R_3 and R_4 have the significance ascribed in claim 1 to R^1, R^2, R^3 and R^4, respectively, with an aqueous solution of a strong base.

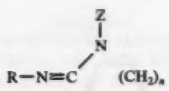
4,061,746

LACTAMIMIDE INHIBITORS OF GASTROINTESTINAL HYPERSECRETION

Thomas R. Blohm; J. Martin Grisar, and Norbert L. Wiech, all of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Apr. 23, 1976, Ser. No. 679,810
Int. Cl.² A61K *31/33, 31/445, 31/38, 31/40*
U.S. Cl. 424—244 51 Claims

1. A method of treating gastrointestinal hypersecretion in a patient in need thereof which comprises administering to said patient a gastrointestinal hypersecretion inhibitory effective amount of a compound of the formula

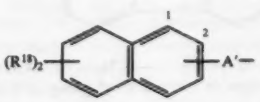


wherein

Z is hydrogen or lower alkyl of from 1 to 4 carbon atoms;

n is an integer of from 5 to 11; and R is a straight or branched alkyl group of from 8 to 15 carbon atoms; or a lower alkoxyalkyl group wherein the alkyl moiety has from 8 to 15 carbon atoms and the alkoxy moiety has from 1 to 4 carbon atoms; a phenylalkylene group wherein the alkylene moiety has from 1 to 6 carbon atoms and wherein the phenyl moiety is unsubstituted or substituted in which case the substituents may be attached at the ortho, meta or para-position of the phenyl ring and are chlorine, fluorine, bromine, lower alkyl having from 1 to 4 carbon atoms, lower alkoxy having from 1 to 4 carbon atoms, or hydroxy;

the group



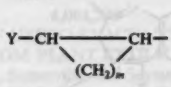
wherein A' is a straight or branched alkylene moiety of from 1 to 6 carbon atoms or benzyl and is attached to either the 1- or 2-position of the naphthalene ring, and R^{18} is hydrogen, chlorine, fluorine, bromine, trifluoromethyl, an alkyl group having from 1 to 12 carbon atoms which is straight or branched, an alkoxy group having from 1 to 3 carbon atoms or NO_2;

1- or 2-adamantyl; 1- or 2-norbornyl;

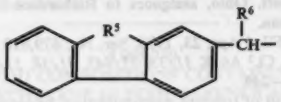
ortho, meta, or para-biphenylyl;

9-fluorenyl which is unsubstituted or substituted in which case the substituents may be attached to any one of the four available carbon atoms of each aromatic ring and are chlorine, bromine, fluorine, a lower alkyl group having from 1 to 4 carbon atoms, a lower alkoxy group having from 1 to 4 carbon atoms, or NO_2;

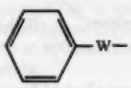
dibenzocyclohepten-5-yl;
the group



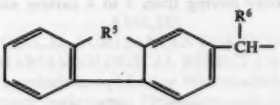
wherein *m* is an integer of from 1 to 6, and Y is a cycloalkyl group having from 5 to 7 carbon atoms, a phenyl group which is unsubstituted or substituted in which case the substituents may be attached to the ortho, meta, or para-position of the phenyl ring and are chlorine, fluorine, bromine, a lower alkyl group having from 1 to 4 carbon atoms or a lower alkoxy group having from 1 to 4 carbon atoms;
the group



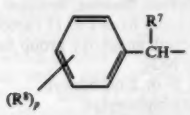
wherein R^2 is phenyl or a cycloalkyl group having from 3 to 6 carbon atoms, and R^3 is hydrogen or methyl;
the group



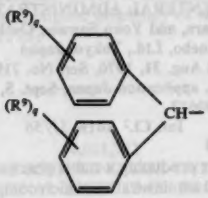
wherein W is a straight or branched divalent alkylene chain having from 2 to 6 carbon atoms which is substituted with one phenyl group on any of the 6 carbon atoms with the proviso that the carbon atom adjacent to the exocyclic nitrogen atom must have at least one hydrogen attached to it;
the group



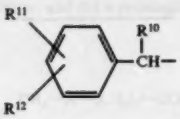
wherein R^5 is $-CH_2-$, $-2CH_2-$ or $-CH=CH-$, and R^6 is hydrogen or a lower alkyl group of from 1 to 4carbon atoms;
the group



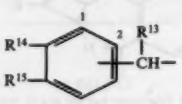
wherein R^7 is cycloalkyl of from 3 to 5 carbon atoms, R^8 is hydrogen, lower alkoxy of from 1 to 4 carbon atoms or lower alkyl of from 1 to 4 carbon atoms, and *p* is the integer 1 or 2;
the group



wherein R^9 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, chlorine, fluorine, bromine, CF_3, SCF_3, OCF_3, phenyl, phenoxy or a lower alkoxy group of from 1 to 4 carbon atoms and *q* is an integer of from 1 to 3;
the group

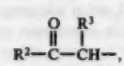


wherein R^{10} is a lower alkyl group of from 1 to 4 carbon atoms, R^{11} is hydrogen or lower alkyl of from 1 to 4 carbon atoms, R^{12} is an alkyl group having from 8 to 14 carbon atoms, an alkoxy group having from 8 to 14 carbon atoms, a cycloalkyl group having from 5 to 14 carbon atoms, phenyl, phenoxy, phenylalkyl wherein the alkyl moiety has from 1 to 4 carbon atoms, phenylalkoxy wherein the alkoxy moiety has from 2 to 4 carbon atoms, 2,2-diphenylvinyl or fluoren-9-ylidene; or
the group



wherein the phenyl moiety is attached to the

moiety through the 1- or 2-position of the phenyl ring, R^{13} is a lower alkyl group of from 1 to 4 carbon atoms and R^{14} and R^{15} taken together are $(-CH_2-)_3$, $-CH_2CH_2C(CH_3)_2-$, $-(CH_2)_4-$ or $-C(CH_3)_2CH_2CH_2C(CH_3)_2-$; with the proviso that when R is the group



Z is hydrogen; and pharmaceutically acceptable acid addition salts thereof or individual optical or geometric isomers.

4,061,747

ANTIDEPRESSANT COMPOSITION

Edgar Eriksoo, and Korfitz Bengt-Ingvar Ohlsson, both of Helsingborg, Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

Filed June 21, 1976, Ser. No. 697,765
Claims priority, application United Kingdom, July 3, 1975, 28136/75
Int. Cl.[2] A61K *31/33*
U.S. Cl. 424—244 7 Claims

1. Solid antidepressant composition for oral use containing as active ingredient an orally-effective amount of lofepramine hydrochloride, at least ten percent by weight of the composition, a pharmaceutically-acceptable carrier, and a stabilizing amount, at least three percent by weight of the composition, of ascorbic acid.

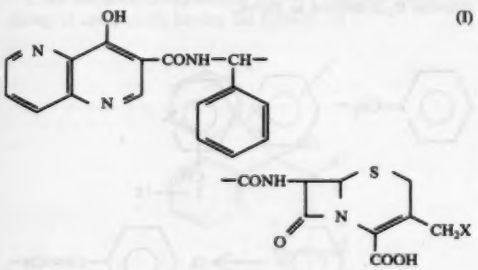
4,061,748

7-(α-(4-HYDROXY-1,5-NAPHTHYRIDINE-3-CARBONAMIDO)-α-PHENYLACETAMIDO) CEPHALOSPORIN DERIVATIVES

Hirotada Yamada, Nishinomiya; Kosaku Okamura, Takarazuka; Hisao Tobiki, Kobe; Norihiko Tanno, Ashiya; Kozo Shimago, Toyonaka; Takenari Nakagome, Nishinomiya; Toshiaki Komatsu, Takarazuka; Akio Izawa, Kawanishi; Hiroshi Noguchi, Maebashi; Kenji Irie, Takarazuka, and Yasuko Eda, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 5, 1976, Ser. No. 674,205
Claims priority, application Japan, Apr. 3, 1975, 50-41011
Int. Cl.[2] A61K *31/545*; C07D *501/36*
U.S. Cl. 424—246 6 Claims

1. A compound of formula (I):



(I)

wherein X is an —S-Het group in which Het is a 5- or 6-membered heterocyclic ring containing 1 to 4 hetero atoms selected from the group consisting of nitrogen, oxygen and sulfur atoms which may be substituted with one or more substituents, and the non-toxic, pharmaceutically acceptable salts thereof.

6. An antimicrobial pharmaceutical composition which comprises a therapeutically effective amount of a compound of claim 1 or a non-toxic, pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier or diluent.

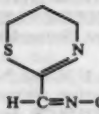
4,061,749

5,6-DIHYDRO-4H-1,3-THIAZINE-2-CARBOXALDEHYDE OXIME USEFUL AS INSECTICIDES

James E. Powell, Kent, England, assignor to Shell Oil Company, Houston, Tex.

Filed July 6, 1976, Ser. No. 703,043
Int. Cl.[2] A01N *9/00, 9/12*; C07D *279/00, 285/00*
U.S. Cl. 424—246 5 Claims

1. The oxime of the formula



4. A method for killing lepidopterous insects which comprises contacting them with an insecticidally effective amount of the oxime of claim 1.

4,061,750

ANTIMICROBIAL COMPOSITION

Arnold Lada, Monmouth Beach; Alfonso N. Petrocci, Glen Rock, both of N.J.; Harold A. Green, Havertown, Pa., and John J. Merianos, Jersey City, N.J., assignors to Kewannee Industries, Bryn Mawr, Pa.

Filed Sept. 13, 1976, Ser. No. 722,390
Int. Cl.[2] A01N *9/22, 9/24*
U.S. Cl. 424—249 6 Claims

1. An antimicrobial composition consisting essentially of a mixture of α-bromocinnamaldehyde and a condensation product of formaldehyde and ethanolamine wherein the formaldehyde and the ethanolamine are reacted in a molar proportion of about 1:1, the α-bromocinnamaldehyde and the condensation product being in a proportion, in parts by weight, of about 1:7 to about 1:9.

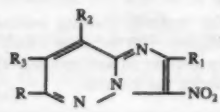
4,061,751

6-SUBSTITUTED 3-NITROIMIDAZO[1,2-b]PYRIDAZINE FOR THE CONTROL OF FOOT ROT AND LIVER LESIONS IN RUMINANT ANIMALS

Alberto Eilert Adam, Wayne, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed July 22, 1976, Ser. No. 707,921
Int. Cl.[2] A61K *31/50, 31/54, 31/535*
U.S. Cl. 424—250 7 Claims

1. A method of treating foot rot and liver abscesses in ruminant animals which comprises, administering to the animals a therapeutically effective amount of a compound having the formula:



wherein R is hydroxy, mercapto, alkoxy (C_1–C_4), alkylthio (C_1–C_4), phthalimidoloweralkoxy, phenylloweralkoxy, lower alkylaminoloweralkoxy, lower alkoxyloweralkoxy, hydroxyloweralkoxy, lower alkenyloxy, halobenzoylloweralkoxy, amino, alkyl (C_1–C_4) amino, dialkyl (C_1–C_4) amino, di(hydroxyloweralkyl)amino, hydroxyloweralkylamino, lower alkoxyloweralkylamino, lower alkenylamino, phenylloweralkylamino, pyridylloweralkylamino, cycloalkyl (C_3–C_6) amino, diloweralkylaminoloweralkylamino, 1-piperidinyl, 1-pyrrolidinyl, 4-loweralkyl-1-piperazinyl, 4-lower alkoxyphenyl-1-piperazinyl, morpholino, imidazolyl, 4-carboloweralkoxy-1piperazinyl or 4-diloweraminoloweralkyl-1-piperazinyl, sulfanilamido, alkyl (C_1–C_4)-sulfanilamido; thiomorpholino-S,S-dioxide; p-chlorobenzoyl hydrazido; p-chlorobenzylidene hydrazino; nicotinylidene hydrazino loweralkylthioloweralkoxy and loweralkylsulfonyloweralkoxy or —NR_4—CO—R_5 where R_4 is hydrogen or alkyl C_1–C_4 and R_5 is alkyl C_1–C_{11}, phenyl, 3,4-dichlorophenyl, 4-chloro-3-nitrophenyl, benzyl, mono and dihaloalkyl C_1–C_4 or 2-phenoxypropionamide; R_1 is hydrogen or alkyl C_1–C_4; R_2 and R_3 are hydrogen or methyl; and the pharmaceutically acceptable acid addition salts thereof.

4,061,752

6-PIPERAZINO-11-METHYLENE-DIBENZAZEPINES[b,E]

Franz Martin Künzle, Bern, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed July 30, 1976, Ser. No. 710,122

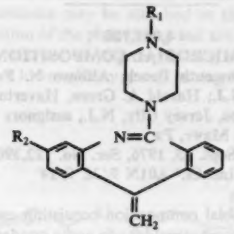
Claims priority, application Switzerland, Aug. 6, 1975, 10247/75; Sept. 11, 1975, 11810/75; Jan. 13, 1976, 319/76

Int. Cl.[2] A61K *31/495;* **C07D** *403/04*

U.S. Cl. 424—250 **12 Claims**

1. A compound of formula I,

I



wherein

R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, or hydroxyalkyl of 1 to 4 carbon atoms, and

R_2 is hydrogen or halogen,

in free base form or in pharmaceutically acceptable acid addition salt form.

10. A pharmaceutical composition comprising a compound of claim **1** in association with a pharmaceutical carrier or diluent.

4,061,753

TREATING PSORIASIS WITH TRANSIENT PRO-DRUG FORMS OF XANTHINE DERIVATIVES

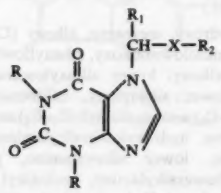
Nicolae S. Bodor, Lawrence, and Kenneth B. Sloan, Eudora, both of Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Filed Feb. 6, 1976, Ser. No. 655,786

Int. Cl.[2] A61K *31/52*

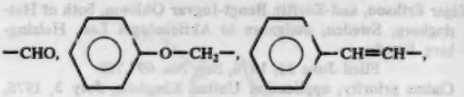
U.S. Cl. 424—253 **99 Claims**

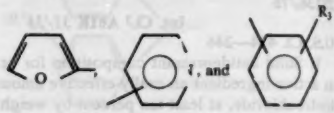
1. A method for topically treating psoriasis on a warm-blooded animal afflicted with the same which comprises topically administering thereto an anti-psoriatic effective amount of a compound having the formula:



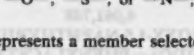
wherein R, which may be the same or different, represents a member selected from the group consisting of $—CH_3$, $—C_2H_5$, iso—C_3H_7, $—C_4H_9$, iso—C_4H_9, pentyl, benzyl, allyl, 2-hydroxyethyl, cyclohexyl, 2-isobutenyl, hydroxymethyl, 2-phenylethyl and $—CH_2O—R_3$, wherein R_3 is defined infra; wherein R_1 represents a member selected from the group consisting of H, C_1-C_7 straight or branched alky, CCl_3, CBr_3, CI_3,

$CH_3O—CH_2—$, $(CH_3)_2NCH_2—$, —CHO,



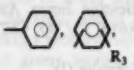


wherein R_3 represents a member selected from the group consisting of —OH, halogen, $—OCH_3$, $—COOCH_3$, $—NO_2$ and $—OCOCH_3$; wherein X is

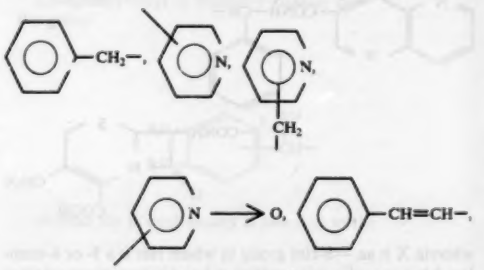


and wherein R_2 represents a member selected from the group consisting of

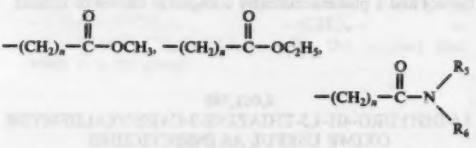
wherein R_4 is a member selected from the group consisting of C_2-C_{20} straight or branched alkyl,



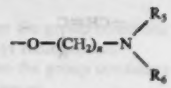
wherein R_3 is defined as above,



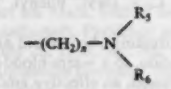
the residue of any naturally occurring amino acid, the residue of any N— substituted amino acid, wherein said substituent is any amino acid protective group cleavable via hydrogenolysis or hydrolysis the residue of an N,N—C_1—C_5—dialkyl or cycloalkylamino acid,



wherein n represents an integer of from 1–5 and R_5 and R_6 which may be the same or different represent C_1-C_5 alkyl or together form a heterocyclic ring with the N atom to which they are attached, imidazolyl, O—C_1—C_8 alkyl, O-benzyl, O-phenyl and



wherein n, R_5 and R_6 are defined as above; and wherein R_2 further represents a member selected from the group consisting of straight or branched C_1–C_{20} alkyl,



wherein n, R_5 and R_6 are defined as above, phenyl, tolyl, xylyl, and $-SO_2-R_7$, wherein R_7 is a straight or branched C_1–C_{20} alkyl.

4,061,754

IMIDAZO[1,2-a]QUINOLINES

Robin Michael Black, Porton, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

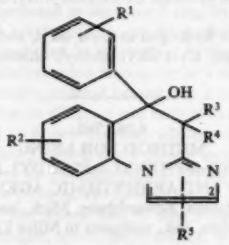
Filed Jan. 7, 1976, Ser. No. 647,279

Claims priority, application United Kingdom, Jan. 16, 1975, 1933/75

Int. Cl.² A61K *31/475;* C07D *235/02*

U.S. Cl. 424—258 5 Claims

1. An imidazo[1,2-a]quinoline selected from the group consisting of compounds having the formula (I)



and the pharmaceutically acceptable acid addition salts thereof, wherein R^1 and R^2 which may be the same or different each represent hydrogen, lower alkyl, lower alkoxy, trifluoromethyl or halogen, R^3 and R^4 which may be the same or different each represent lower alkyl and R^5 represents hydrogen, lower alkyl, phenyl, phenyl substituted by R^1 or phenyllower-alkyl, with the proviso that R^3 and R^4 cannot be groups which give rise to steric hindrance.

5. A hypotensive composition comprising a hypotensively effective amount of an imidazo[1,2-a]quinoline selected from the group consisting of compounds having the formula (I) and the pharmaceutically acceptable acid addition salts thereof, wherein R^1 and R^2 which may be the same or different each represent hydrogen, lower alkyl, lower alkoxy, trifluoromethyl or halogen, R^3 and R^4 which may be the same or diffent each represent lower alkyl and R^5 represents hydrogen, lower alkyl, phenyl, phenyl substituted by R^1 or phenyllower-alkyl, with the proviso that R^3 and R^4 cannot be groups which give rise to steric hindrance in association with a pharmaceutically acceptable carrier.

4,061,755

COCCIDIOCIDAL COMBINATION OF MONENSIN AND METICHLORPINDOL

Larry R. McDougald, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 25, 1976, Ser. No. 670,485

Int. Cl.² A01N *9/02;* A61K *31/44*

U.S. Cl. 424—263 5 Claims

1. A coccidiocidal composition for poultry comprising coccidiocidally-ineffective concentrations of monensin and of metichlorpindol, which coccidiocides are synergistically coccidiocidally effective in combination, together with a poultry feedstuff or drinking water, wherein the concentrations are from about 35 to 65 ppm. of monensin and from about 20 to about 70 ppm. of metichlorpindol, which concentrations are such that the combination is synergistic.

4,061,756

METHODS FOR TREATING CARDIOVASCULAR DISORDERS

Stephen G. Hastings, Chelsea; Bruno P. H. Poschel, and Donald E. Butler, both of Ann Arbor, all of Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Dec. 17, 1976, Ser. No. 751,829

Int. Cl.² A61K *31/44*

U.S. Cl. 424—263 5 Claims

1. A method for treating cardiovascular disorders in a mammal which comprises administering an effective amount of 3-phenoxypyridine or a pharmaceutically acceptable acid-addition salt thereof to a mammal suffering from cardiovascular disorders.

4,061,757

COMPOUNDS HAVING JUVENILE HORMONE ACTIVITY

Hans Berg Madsen, Bovlingbjerg; Preben Lindholm Holst, and Houk Solli, both of Harboor, all of Denmark, assignors to A/S Cheminova, Lemvig, Denmark

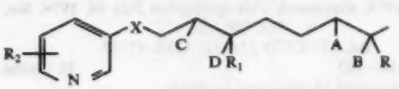
Continuation-in-part of Ser. No. 435,057, Jan. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 292,375, Sept. 26, 1972, abandoned. This application Sept. 23, 1975, Ser. No. 615,960

Claims priority, application United Kingdom, Sept. 27, 1971, 44884/71; Denmark, Jan. 24, 1973, 386/73

Int. Cl.² C07D *213/30;* A61K *31/44*

U.S. Cl. 424—263 32 Claims

1. A chemical compound corresponding to the formula



I

in which A and B, when taken together, represent a further single bond between the adjacent carbon atoms, or an oxygen bridge, or, when taken individually, A represents a hydrogen atom, and B represents a lower alkyl group, a lower alkoxy group or a hydroxy group, C and D, when taken together, represent a further single bond, or, when taken individually C and D each represent a hydrogen atom, R and R_1 each represent a methyl or ethyl group, R_2 represents a hydrogen atom or at least one substituent selected from the group consisting of halogen atoms, lower alkyl, lower alkoxy and nitro groups, and X is 0.

5. A composition for the control of insects which comprises an inert carrier and a compound as claimed in claim 1, the composition containing said compound in an amount effective to inhibit the metamorphosis of insects.

4,061,758
TREATING HYPERTENSION AND CENTRAL NERVOUS SYSTEM ABNORMALITIES

John Leheup Archibald, Windsor, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

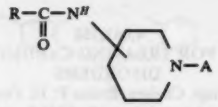
Continuation-in-part of Ser. No. 569,242, April 18, 1975, Pat. No. 4,024,147, which is a continuation-in-part of Ser. No. 373,046, June 25, 1973, abandoned. This application Feb. 24, 1977, Ser. No. 771,591

Claims priority, application United Kingdom, June 30, 1972, 30636/72

Int. Cl.[2] A61K *31/44*

U.S. Cl. 424—263 **3 Claims**

1. A pharmaceutical composition having hypotensive activity or central nervous system activity comprising a carrier and an effective amount of a compound selected from those of the formula



and their pharmaceutically acceptable acid addition salts, wherein A represents a member selected from the class consisting of

i. alkyl containing 2 to 3 carbon atoms monosubstituted by a substituent selected from hydroxyl, di(lower alkyl) amino, cyano, halogen, groups of the formula —CO.NX.Y where X and Y are selected from hydrogen and lower alkyl, groups of the formula —CO.T where T is lower alkyl, the semicarbazone and phenylhydrazone derivatives of said groups of formula —CO.T, (Lower alkoxy) carbonyl and groups of the formula —$N(CH_2R^1)R^2$ where R^1 is selected from phenyl, monohalophenyl, mono(lower alkyl) phenyl and mono(lower alkoxy) phenyl and R^2 is pyridyl; and

ii. di(lower alkyl) amino (lower alkoxy) carbonyl; and R represents a member selected from the class consisting of phenyl and phenyl substituted by one to two substituents selected from lower alkyl, halogen and nitro.

4,061,759
ETHENYL AND ETHYNYL MERCAPTOALKYL PYRIDINES

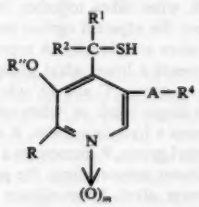
Tsung-Ying Shen, Westfield; Howard Jones, Holmdel, and Conrad P. Dorn, Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 578,692, May 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 464,011, April 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 368,772, June 15, 1973, abandoned. This application July 16, 1976, Ser. No. 706,033

Int. Cl.[2] C07D *213/32*; A61K *31/44*

U.S. Cl. 424—263 **21 Claims**

1. A compound of structural formula:



or pharmaceutically acceptable salt thereof wherein

m is 0 or 1;

R″ is H or C_{2-6} alkanoyl;

A is

or —C≡C—

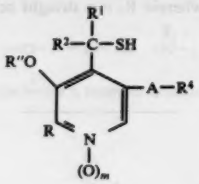
where R^7 is hydrogen, chloro or fluoro;

R is C_{1-3} alkyl, hydroxy, C_{2-6} alkanoyloxy, or hydroxy - C_{1-3} alkyl;

R^1 and R^2 are hydrogen or C_{1-3} alkyl; and

R^4 is hydrogen, C_{1-3} alkyl, phenyl, chloro, fluoro, or carboxyl.

15. A method of treating rheumatoid arthritis which comprises the administration, to a warm-blooded animal or human in need of such treatment, an effective amount of a compound of structural formula:



or pharmaceutically acceptable salt thereof wherein

m is 0 or 1;

R″ is H or C_{2-6} alkanoyl;

A is

or — C≡C—

where R^7 is hydrogen, chloro or fluoro;

R is C_{1-3} alkyl, hydroxy, C_{2-6} alkanoyloxy, or hydroxy - C_{1-3} alkyl;

R^1 and R^2 are hydrogen as C_{1-3} alkyl; and

R^4 is hydrogen, C_{1-3} alkyl, phenyl, chloro, fluoro, or carboxyl.

4,061,760
METHOD FOR USING 3-SUBSTITUTED-5-PHENYL-5-PYRIDYL HYDANTOINS AS ANTIARRHYTHMIC AGENTS

Herbert John Havera, Edwardsburg, Mich., and Wallace Glenn Strycker, Goshen, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

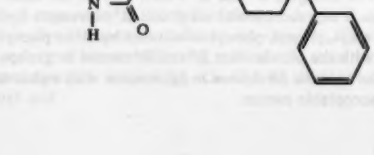
Division of Ser. No. 664,920, March 8, 1976, Pat. No. 3,994,904. This application Oct. 4, 1976, Ser. No. 729,164

Int. Cl.[2] A61K *31/445*

U.S. Cl. 424—267 **10 Claims**

1. In a therapeutic method of treating a cardiac arrhythmia in an individual in whom such therapy is indicated by administration of an antiarrhytmic agent, the improvement comprising:

administering to the individual an effective antiarrhythmic amount of a compound having the formula,



or a pharmacologically acceptable, non-toxic salt thereof, in which:

R^1 is selected from the group consisting of 2-pyridyl, 3-pyridyl, or 4-pyridyl radicals; and

R^2 is selected from the group consisting of a hydrogen atom or a hydroxyl group.

4,061,761
THIAZOLIDINE DERIVATIVES

Hans-Jochen Lang, Altenhain, Taunus, and Roman Muschaweck, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

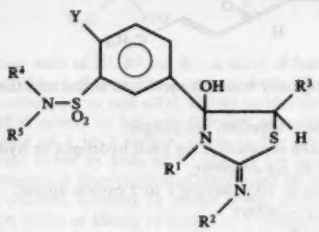
Filed July 25, 1975, Ser. No. 599,103

Claims priority, application Germany, July 27, 1974, 2436263

Int. Cl.[2] A61K *31/425;* C07D *277/08*

U.S. Cl. 424—270 **12 Claims**

1. A thiazolidine derivative of the formula



and acid addition salts thereof with a pharmaceutically acceptable acid, wherein R^1 is alkyl or alkenyl having 1 to 4 carbon atoms, cycloalkyl having 3 to 6 carbon atoms, or dialkylamino having a total of up to 7 carbon atoms; R^2 is alkyl, alkenyl, or alkinyl having 1 to 8 carbon atoms which may optionally be substituted by alkoxy having 1 to 4 carbon atoms, or R^2 is cycloalkyl having 3 to 8 carbon atoms, or R^2 is phenylalkyl having 1 to 2 carbon atoms in the alkyl moiety which may optionally be substituted in the phenyl ring by halogen, lower alkyl, alkoxy, or alkylenedioxy, or R^2 is alkyl having 1 to 2 carbon atoms substituted by cycloalkyl having 3 to 6 carbon atoms, or R^2 is dialkylamino having up to a total of 7 carbon atoms; R^3 is hydrogen or alkyl having 1 to 2 carbon atoms; R^4 and R^5 are identical or different and each is hydrogen, alkyl or alkenyl having 1 to 6 carbon atoms which may optionally be substituted by alkoxy having 1 to 4 carbon atoms, or R^4 and R^5 each is cycloalkyl or cycloalkylalkyl having 3 to 9 carbon atoms, phenyl, or phenylalkyl having 1 to 3 carbon atoms in the alkyl moiety, the phenyl ring of which may optionally be substituted by halogen, lower alkyl, alkoxy, or alkylenedioxy; and Y is hydrogen, halogen, methyl or trifluoromethyl.

4,061,762
NAPHTH-[2,1-d]-ISOTHIAZOLE AND NEMATOCIDAL USES THEREOF

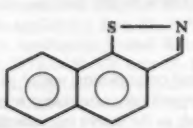
Heinrich Adolphi, Limburgerhof; Helmut Fleig, Mannheim, and Helmut Hagen, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 12, 1976, Ser. No. 704,561

Int. Cl.[2] C07D *265/04;* A61K *31/425*

U.S. Cl. 424—270 **2 Claims**

1. Naphth-[2,1-d]-isothiazole of the formula



2. A process for combatting nematodes, wherein the soil in which the nematodes live is treated with a nematode-toxic amount of naphth-[2,1-d]-isothiazole.

4,061,763
TRICYCLICDICARBOXIMIDES

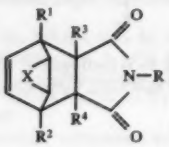
Kenneth L. Shepard, Ambler, and William J. Paleveda, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 575,918, May 9, 1975, Pat. No. 4,006,233, which is a continuation-in-part of Ser. No. 511,961, Oct. 4, 1974, abandoned. This application Aug. 12, 1976, Ser. No. 713,765

Int. Cl.[2] C07D *403/04, 209/04;* A61K *31/40*

U.S. Cl. 424—274 **4 Claims**

1. A compound having the formula:



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wherein:

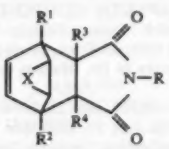
R^1, R^2, R^3 and R^4 are hydrogen,

X is $-CH_2-$ or $-CH=CH-$;

R is $-CH_2C\equiv CH$ or

wherein Y is hydrogen, or halogen and R^5 is amino, acetamido, propionamido or valeramido; or a non-toxic pharmaceutically acceptable salt thereof.

3. A pharmaceutical composition for treating anxiety comprising a therapeutically effective amount in unitary dosage form of a compound having the formula:

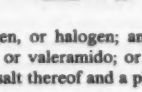


wherein:

R^1, R^2, R^3 and R^4 are hydrogen;

X is $-CH_2-$ or $-CH=CH-$;

R is $-CH_2C\equiv CH$ or



wherein Y is hydrogen, or halogen; and R^5 is amino, acetamido, propionamido or valeramido; or a non-toxic pharmaceutically acceptable salt thereof and a pharmaceutical carrier thereof.

4,061,764

CERTAIN O-SUBSTITUTED THIOPHENE OXIME CARBAMATES USED AS ANTIBACTERIAL AND ANTIFUNGAL AGENTS

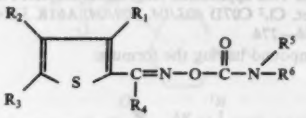
Aldo Joseph Crovetti, Lake Forest, Ill., and Robert George Stein, Kenosha, Wis., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 385,020, Aug. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 201,184, Nov. 22, 1971, abandoned. This application May 19, 1975, Ser. No. 578,792

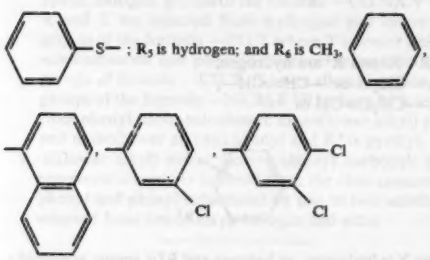
Int. Cl.[2] A01N *9/12*

U.S. Cl. 424—275 7 Claims

1. A method of inhibiting the growth of microorganisms selected from the group consisting of fungi and bacteria, which method comprises applying to said microorganisms an amount to inhibit the growth of said microorganisms of a compound of the formula:



wherein R_1 is hydrogen; R_2 is hydrogen or NO_2; R_3 is hydrogen, NO_2, halo or CH_3; R_4 is CH_3, C_2H_5, CF_3, CH_3S-cyano or



or $-CH_2CH=CH_2$

4,061,765

POLYHYDROXYPHENYLCHROMANONE SALTS AND THERAPEUTIC COMPOSITION

Rolf Hermann Heinrich Madaus, Cologne-Bruck; Gunter Haibach, Cologne, and Wilfried Trost, Bensberg-Fraukenforst, all of Germany, assignors to Dr. Madaus & Co., Cologne, Germany

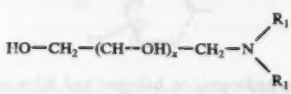
Division of Ser. No. 435,367, Jan. 21, 1974, Pat. No. 3,994,925. This application July 29, 1976, Ser. No. 709,734

Claims priority, application Germany, Jan. 19, 1973, 2302593

Int. Cl.[2] A61K *31/335*

U.S. Cl. 424—278 23 Claims

3. Method of treating a subject suffering from liver damage or inflammation, which comprises administering to said subject in therapeutically effective amounts a salt of a Silymarin group polyhydroxyphenylchromanone with a pharmaceutically acceptable monoamino polyhydroxy alcohol of the formula.



wherein X is an integer from 3 to 5; and R_1 and R_2 are hydrogen, lower alkyl or lower hydroxyalkyl.

4,061,766

CYCLOPENTANE DERIVATIVES AND PROCESS FOR PREPARING THEM

Wilhelm Bartmann, Neuenhain, Taunus; Rudolf Kunstmann, Breckenheim, Taunus; Ulrich Lerch, Hofheim, Taunus, and Bernward Schölkens, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

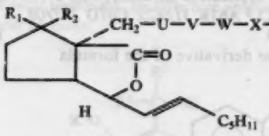
Filed Oct. 28, 1976, Ser. No. 736,526

Claims priority, application Germany, Oct. 31, 1975, 2548814

Int. Cl.[2] A61K *31/34;* C07C *177/00*

U.S. Cl. 424—279 4 Claims

1. A compound of the formula



and the physiologically tolerable metal and amine salts thereof, wherein

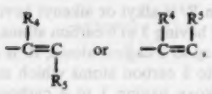
R_1 and R_2, taken together, are oxygen;

R_1 and R_2, taken separately, are each hydrogen or hydroxy but R_1 and R_2 are different;

R_3 is hydrogen or alkyl having 1 to 5 carbon atoms;

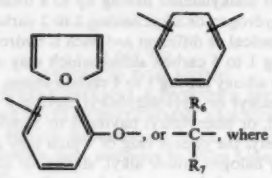
U is $-(CH_2)_m-$, where

m is 0 to 5, or is



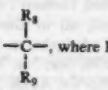
where R_4 and R_5 are the same or different and are hydrogen or alkyl having 1 to 5 carbon atoms;

V is a single bond, oxygen,



R_6 and R_7 are the same or different and are hydrogen or alkyl having 1 to 5 carbon atoms;

W is a single bond or



where R_8 and R_9 are the same or different and are hydrogen or alkyl having 1 to 5 carbon atoms; and

X is $-(CH_2)_m-$,

where *m* is 0 to 5.

3. A pharmaceutical composition useful as a prostaglandin antagonist, said composition comprising a pharmaceutically acceptable carrier and, as the active ingredient, a compound or salt as in claim 1 in an amount producing an antiprostaglandin effect.

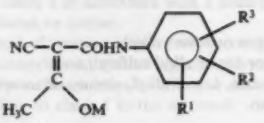
4,061,767

CYANO ACETIC ACID ANILIDE DERIVATIVES, PROCESS FOR THEIR MANUFACTURE AND COMPOSITIONS CONTAINING THESE COMPOUNDS

Hartmut Ertel; Günther Heubach, both of Kelkheim, Taunus, and Erhard Wolf, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

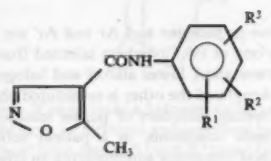
Filed June 3, 1976, Ser. No. 692,318
Claims priority, application Germany, June 5, 1975, 2524929
Int. Cl.[2] A61K *31/36*, *31/275*; C07C *121/78*; C07D *17/06*
U.S. Cl. 424—282 8 Claims

1. A 2-hydroxyethylidene-cyano acetic acid aniline of the formula



wherein each of R^1, R^2 and R^3, is alkyl of from 1 to 3 carbon atoms, alkoxy of from 1 to 3 carbon atoms, alkylthio of from 1 to 3 carbon atoms; said alkyl, alkoxy or alkylthio substituted in the alkyl moiety by halogen; halogen; nitro; cyano or alkoxycarbonyl of 1 to 3 carbon atoms in the alkyl moiety; also wherein either or both of R^1 and R^2 are hydrogen, and R^3 additionally is phenyl; phenyl substituted by one or two fluorine, chlorine, bromine or iodine atoms, alkyl of from 1 to 3 carbon atoms or alkoxy of from 1 to 3 carbon atoms; phenoxy; or phenoxy substituted by one or two fluorine, chlorine, bromine or iodine atoms, alkyl of from 1 to 3 carbon atoms or alkoxy of from 1 to 3 carbon atoms; but R^3 is not methyl when both R^1 and R^2 are hydrogen; or R^1 is hydrogen, and R^2 and R^3 together are methylene-dioxy or, together with the phenyl ring to which they are linked, naphthalene; and M is hydrogen, an alkali metal or ammonium.

5. A process for the manufacture of a compound as defined in claim 1, which comprises treating an isoxazole of the formula



wherein R^1, R^2 and R^3 have the meaning assigned in claim 1, with a base and optionally reacting the resulting alkali metal or ammonium compound as defined in claim 1 with a mineral acid or a strong organic acid.

8. A method of combatting pains and/or inflammations which comprises administering to a patient an effective amount of a compound as defined in claim 1.

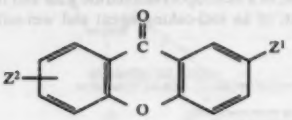
4,061,768

CERTAIN CYCLIC CARBONYL COMPOUNDS USED IN THE PROPHYLAXIS OF ALLERGIC CONDITIONS

John Henry Gorvin, London, England, assignor to Burroughs Wellcome Co., N.C.

Division of Ser. No. 338,578, March 6, 1973, Pat. No. 3,950,342, which is a continuation of Ser. No. 287,043, July 9, 1972, abandoned. This application Dec. 19, 1975, Ser. No. 642,662
Claims priority, application United Kingdom, Feb. 24, 1972, 8609/72; Feb. 24, 1972, 8610/72; Aug. 29, 1972, 39940/72; Aug. 29, 1972, 40079/72; Sept. 8, 1971, 41852/71
Int. Cl.[2] A61K *31/35*; C07D *311/00*
U.S. Cl. 424—283 24 Claims

1. A method of inhibiting the symptoms of asthma or allergic rhinitis in a mammal susceptible to asthma or allergic rhinitis, which comprises administration to said mammal of a prophylactically effective anti-asthma or anti-allergic rhinitis non toxic dose of a compound of formula (I)



(I)

wherein Z^1 is carboxyl, a pharmaceutically acceptable carboxylate salt, alkyl carboxylate, carboxamide, N-alkyl carboxamide or N,N-dialkylcarboxamide, and Z^2 is a substituent in the 6-position selected from the meanings of Z^1 as defined, wherein the "alkyl" moiety of alkyl carboxylate, N-alkylcarboxamide and N,N-dialkyl carboxamide has 1 to 6 carbon atoms.

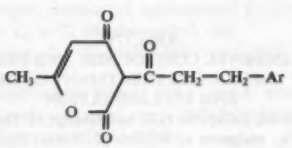
4,061,769

METHOD AND COMPOSITION FOR TREATING HYPERTENSION

Masaji Ohno, and Mutsuo Kataoka, both of Kamakura, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Division of Ser. No. 353,559, May 24, 1973, Pat. No. 3,963,756. This application Apr. 1, 1976, Ser. No. 672,594
Claims priority, application Japan, May 24, 1972, 47-50776
Int. Cl.[2] A61K *31/35*, *31/36*
U.S. Cl. 424—283 14 Claims

1. A pharmaceutical composition suitable for use in treating essential hypertension in adult humans comprising a hypotensively effective amount of an agent selected from the group consisting of 6-methyl-2H-pyran-2,4(3H)-diones of the formula:



wherein Ar is phenyl substituted by at least one member selected from the group consisting of halogen, hydroxyl, trifluoromethyl, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms and alkylenedioxy of the formula —O—R'''—O— wherein R''' is alkylene of 1—4 carbon atoms, provided that said substituted phenyl is not 3,4-dimethoxyphenyl; and the physiologically acceptable salts thereof in combination with a pharmaceutically acceptable carrier.

4,061,770

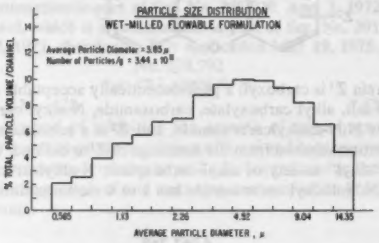
FLOWABLE, AQUEOUS PESTICIDE COMPOSITIONS OF IMPROVED ACTIVITY

Alfred F. Marks, Mentor, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Apr. 15, 1976, Ser. No. 677,141
The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.
Int. Cl.[2] A01N *9/20*
U.S. Cl. 424—304 7 Claims

1. A process for preparing a flowable, homogeneous, storage-stable aqueous pesticide composition which comprises successively charging to a chamber equipped with metal balls, water in sufficient quantity to provide, in combination with the other ingredients, 100%, by weight, of finished composition, from 1.0 to 10%, by weight of a non-ionic surfactant, from 0 to 5%, by weight, of a liquid antifoaming agent, from 0 to 10%, by weight, of a freeze-point depressant, and from 10 to 60%, by weight, of an essentially water-insoluble, pesticidally-active component having an average particle size ranging from about

5 microns to over 15 microns; homogeneously mixing the ingredients in the chamber by the shearing action of the rotating metal balls; thereafter adding successively from 0.02 to 1.0%, by weight, of a heteropolysaccharide gum and from 0 to 10%, by weight, of an anti-caking agent and wet-milling the



resulting mixture until said gum component is uniformly admixed and the mixture thickens significantly, the total wet-milling time ranging from 1 to 30 hours, the average particle size of the pesticidally-active component in the finished composition being 1.0–5.0 microns.

4,061,771

ETHYNYLINDENYL COMPOUNDS AND DERIVATIVES THEREOF USED IN THE TREATMENT OF PAIN, FEVER AND INFLAMMATION

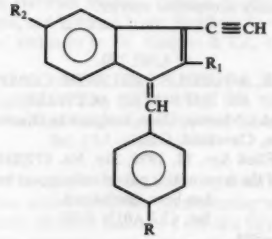
Julius Diamond, Lafayette Hill, and George H. Douglas, Paoli, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 433,677, Jan. 16, 1974, Pat. No. 3,983,253, which is a division of Ser. No. 306,702, Nov. 15, 1972, Pat. No. 3,810,944. This application July 28, 1976. Ser. No. 709,438

Int. Cl.[2] A61K *31/275;* **C07C** *121/50*

U.S. Cl. 424—304 **39 Claims**

1. A compound of the formula



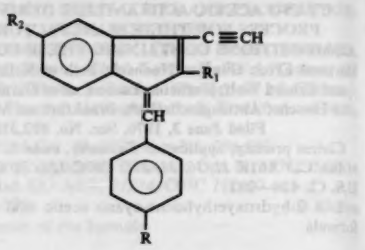
in which

R_1 is hydrogen or lower alkyl;

R is cyano or lower alkyl sulfinyl; and

R_2 is halo, nitro, lower alkyl, amino, or mono- or di-lower alkylamino.

14. A method for the relief of inflammation in a patient which comprises the administration thereto of a therapeutically effective amount between 0.5 mg. to 100 mg. per kg. of body weight per day of a compound of the formula



in which

R_1 is hydrogen or lower alkyl;

R is cyano or lower alkyl sulfinyl; and

R_2 is halo, nitro, lower alkyl, amino, or mono- or di-lower alkylamino.

4,061,772

DERIVATIVES OF THE 1,2-DIARYLETHYLENE AND PHARMACEUTICAL COMPOSITIONS THEREOF

Hermann Teufel, Kelkheim, Taunus; Wilhelm Bartmann, Neuenhain, Taunus; Ernold Granzer, Kelkheim, Taunus, and Josef Musil, Konigstein, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

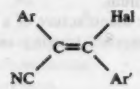
Division of Ser. No. 556,221, March 7, 1975, Pat. No. 4,001,431. This application Aug. 19, 1976, Ser. No. 715,824

Claims priority, application Germany, Mar. 9, 1974, 2411325

Int. Cl.[2] A61K *31/275;* **C07C** *121/70*

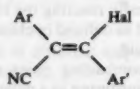
U.S. Cl. 424—304 **3 Claims**

1. A 1,2-diaryl-ethylene of the formula



wherein Hal is chlorine or bromine and Ar and Ar′ are each phenyl substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogen, or one of Ar and Ar′ is phenyl and the other is substituted phenyl.

3. A method for treating disorders of purine metabolism, hyperlipidemiae, or both conditions, in a patient suffering therefrom, which method comprises administering an effective amount of a compound of the formula



wherein Hal is chlorine or bromine and Ar and Ar′, which are the same or different, are phenyl or phenyl substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogen.

4,061,773

GLYCYRRHETINIC ACID DERIVATIVES

Rosalind Po Kuen Chan, London, England, assignor to Biorex Laboratories Limited, London, England

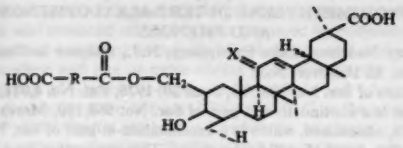
Filed Jan. 22, 1976, Ser. No. 651,594

Claims priority, application United Kingdom, Feb. 7, 1975, 5296/75

Int. Cl.[2] A61K *31/22;* **C07C** *69/34, 69/74*

U.S. Cl. 424—313 **18 Claims**

1. A compound of the formula



wherein R is alkylene of 1–10 carbon atoms and X represents an oxygen atom or two hydrogen atoms; or a non-toxic salt or methyl or ethyl ester thereof.

14. A pharmaceutical composition comprising a compound according to claim 1 in admixture with a solid or liquid pharmaceutical diluent or carrier.

16. A method of treating inflammatory conditions in mammals, which comprises administering topically, orally, rectally or parenterally a therapeutically effective amount of a compound according to claim 1 to the mammal.

4,061,774

HALOGENATED AMINO METHYL ADAMANTANE DERIVATIVES

Jiban Kumar Chakrabarti, Camberley; Terrence Michael Hotten, Farnborough, and David Edward Tupper, Bracknell, all of England, assignors to Lilly Industries, Limited, London, England

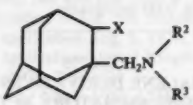
Continuation-in-part of Ser. No. 554,023, Feb. 28, 1975, abandoned. This application Apr. 9, 1975, Ser. No. 566,502

Claims priority, application United Kingdom, Mar. 2, 1974, 9521/74; Mar. 4, 1974, 9576/74

Int. Cl.² A61K *31/13;* **C07C** *87/40*

U.S. Cl. 424—325 **12 Claims**

1. A compound of the formula



wherein X represents a halogen atom, and wherein R^2 and R^3 are the same or different and represent hydrogen or a C_{1-4} alkyl group, at least one of R^2 and R^3 being C_{1-4} alkyl; or a pharmaceutically acceptable non-toxic acid addition salt thereof.

7. A pharmaceutical formulation containing as an active ingredient into anti-Parkinsonian effective amount of a compound of claim 1 associated with a pharmaceutically acceptable carrier therefor.

10. A method of treating a human suffering from Parkinson's disease which comprises administering a therapeutically effective amount of an adamantane compound of claim 1 to the human.

4,061,775

POLYAMINE COMPOUNDS AS ANTIBACTERIAL AGENTS

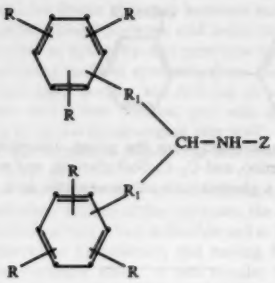
Richard A. Dybas, Center Square, Pa.; Nathaniel Grier, Englewood, and Bruce E. Witzel, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sept. 2, 1975, Ser. No. 609,773

Int. Cl.² A01N *9/20*

U.S. Cl. 424—330 **4 Claims**

1. An antibacterial composition comprising a compound of the formula:



where

R is hydrogen or loweralkyl;

each R_1 is alike or different and is C_1 to C_4 alkylene;

Z is $-Y-\underset{\underset{R_5}{|}}{N}-R_6$, where

Y is $-R_2-\underset{\underset{R_3}{|}}{N}-R_4-$ or Y is $-R_2-$

and

R_2 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

R_3 is hydrogen, C_1 to C_4 alkyl, C_2 to C_4 aminoalkyl, C_1 to C_4 hydroxyalkyl, or C_2 to C_4 dihydroxyalkyl;

R_4 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

R_5 is hydrogen, aminoethyl, aminopropyl, C_1 to C_4 hydroxyalkyl, or C_2 to C_4 dihydroxyalkyl; and

R_6 is hydrogen, C_1 to C_4 hydroxyalkyl or C_2 to C_4 dihydroxyalkyl;

or acid addition salts thereof and a carrier, where 5 to 100 parts of said compound are included in said composition per million parts of said carrier.

4,061,776

PHARMACEUTICALLY ACTIVE 2-OMEGA-AMINOALKOXYDIPHENYL ETHERS

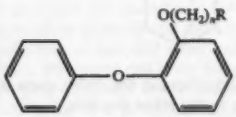
Ryoji Kikumoto, Machida; Akihiro Tobe, Kawasaki, and Hidenobu Ikoma, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 612,005, Sept. 10, 1975, abandoned. This application Nov. 18, 1976, Ser. No. 742,877

Int. Cl.² A01N *9/20, 9/24;* **C07C** *93/06*

U.S. Cl. 424—330 **7 Claims**

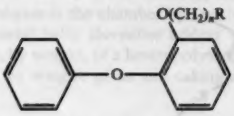
1. A compound having the formula (I):



wherein R is selected from the group consisting of amino, C_1–C_5 alkylamino, and C_2–C_6 dialkylamino; *n* is an integer of 4 or 5; or a pharmaceutically acceptable acid addition salt thereof.

6. A method for palliating conditions of depression in warm-blooded animals, which comprises:

administering to said animal an antidepressant effective amount of a compound of the formula (I):



wherein R is selected from the group consisting of amino, C_1–C_5 alkylamino, and C_2–C_6 dialkylamino; and *n* is an integer of 4 or 5; or a pharmaceutically acceptable acid addition salt thereof.

4,061,777

VASODILATORY TERPENO-PHENOXYALKYLAMINES

Jean Mardiguian, Paris, France, assignor to Mar-Pha, Societe d'Etudeet d'Exploitation de Marques Mar-Pha, France

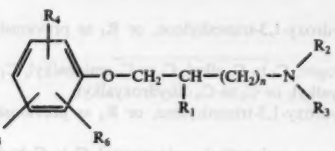
Filed Apr. 9, 1975, Ser. No. 566,361

Claims priority, application United Kingdom, Apr. 11, 1974, 16074/74

Int. Cl.² A61K *31/135;* **C07C** *93/06*

U.S. Cl. 424—330 **18 Claims**

1. A terpeno-phenoxyalkylamine of the general formula:



(I)

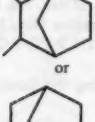
in which n is 0, 1 or 2,

R_1 is a hydrogen atom, a lower alkyl radical having a straight or branched chain with 1 to 4 carbon atoms, or an OH group,

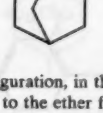
R_2 and R_3 each represent H, or a lower alkyl radical having a straight chain or branched chain with up to 4 carbon atoms, or a hydroxyethyl radical,

R_4 is a terpene radical chosen from the following group:

2-isobornyl (2)

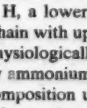


5-camphyl (5)



or

2-norbornyl (2)



of exo or endo configuration, in the ortho, meta or para position with respect to the ether function,

R_5 and R_6 may each be H, a lower alkyl radical having a straight or branched chain with up to 4 carbon atoms or a halogen atom, or a physiologically acceptable non-toxic acid salt or quaternary ammonium salt thereof.

17. A pharmaceutical composition useful for causing vasodilatation of the coronaries in a patient containing as the active agent a terpeno-phenoxyalkylamine according to claim 1 in a physiologically active amount and a non-toxic pharmaceutically acceptable carrier.

4,061,778

IMINODIMETHYLENE DI-TERT-ALKYLOPHENONES AND PHENOLS

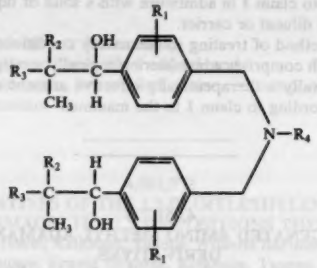
Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 588,789, June 20, 1975, Pat. No. 4,011,344, which is a continuation-in-part of Ser. No. 558,180, March 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 460,891, April 15, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 742,556

Int. Cl.² A01N *9/20, 9/24;* **C07C** *87/28*

U.S. Cl. 424—330 **7 Claims**

1. A compound of the formula



wherein

R_1 represents hydrogen, halo having an atomic weight of about 19 to 36 or straight chain lower alkoxy, and

R_2 and R_3 each independently represent lower alkyl having 1 to 2 carbon atoms, and

R_4 represents lower alkyl having 1 to 4 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

6. A pharmaceutical composition in unit dosage form useful as a hypolipidemic agent comprising a compound of claim 1 and a pharmaceutically acceptable diluent or carrier therefor, said compound being present in an amount of from about 75.0 milligrams to about 1000 milligrams.

4,061,779

NAPHTHALENE DERIVATIVES HAVING ANTI-INFLAMMATORY ACTIVITY

Anthony William Lake, Saffron Waldon, and Carl John Rose, London, both of England, assignors to Beecham Group Limited, United Kingdom

Continuation-in-part of Ser. No. 563,159, Nov. 28, 1975, abandoned, which is a division of Ser. No. 501,773, Aug. 29, 1974, abandoned. This application Dec. 8, 1976, Ser. No. 748,676

Claims priority, application United Kingdom, Sept. 11, 1973, 42550/73

Int. Cl.² A61K *31/12;* **C07C** *49/76*

U.S. Cl. 424—331 **13 Claims**

7. A method of reducing inflammation in humans which comprises administering to a human in need thereof an amount of a composition of claim 1 sufficient to produce an anti-inflammatory effect without an undesired oestrogenic effect.

13. Solid 4-(6′-methoxy-2′-naphthyl)butan-2-one having a melting poit of not less than 78.5° C.

4,061,780

COSMETIC OIL CONTAINING ISOBUTYLENE

Moritoshi Yoshida, Chofu; Takashi Yamamoto, Yokohama, and Sumito Nii, Fujisawa, all of Japan, assignors to Nichiyu Kagaku Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 425,617, Dec. 17, 1973, abandoned. This application Nov. 17, 1975, Ser. No. 632,578

Claims priority, application Japan, Dec. 20, 1972, 47-127823

Int. Cl.² A61K *47/00, 7/025*

U.S. Cl. 424—358 **2 Claims**

1. An oil-based cosmetic composition containing from 3 to

30 percent by weight of a cosmetic oil and the balance is conventional cosmetic ingredients for oil-based cosmetic compositions, said cosmetic oil having been prepared by polymerizing a substance consisting essentially of isobutylene or a mixture of isobutylene and one or more olefins selected from the group consisting of 1-butene, 2-butene, 1,2-butadiene and 1,3-butadiene, at a temperature of from −30° to +60° C, in the presence of a Friedel-Craft's catalyst or Lewis acid, to obtain a crude liquid polymer product; distilling said crude liquid polymer product under reduced pressure to separate materials having boiling points of less than 120° C at 1 to 2 mmHg and materials having boiling points of more than 200° C at 1 to 2 mmHg, and recovering a purified polymer product having a boiling point range of from 120° to 200° C at 1 to 2 mmHg and having an average molecular weight in the range of from about 250 to about 600; hydrogenating said purified polymer product to hydrogenate substantially all the double bonds in said purified polymer product; and deodorizing said hydrogenated purified polymer product to obtain said cosmetic oil by one of the steps of (1) steam distilling the hydrogenated purified polymer product under reduced pressure at a temperature below 130° C, or (2) treating the hydrogenated purified polymer product with activated carbon, or (3) effecting solvent extraction of the hydrogenated purified polymer product, or combinations of steps (1), (2) and (3), to remove impurities from the hydrogenated purified polymer product, said cosmetic oil having an average molecular weight in the range of from 250 to 600 and being substantially free of materials having molecular weights below 250 and above 600, said cosmetic oil being colorless and odorless, having a peroxide value, a bromine number, a carbonyl value and an acid value all of substantially zero, and having a viscosity of from 15 to 35 centistokes at 100° F.

4,061,781

EDIBLE PROTEIN SUBSTANCES COMPOSED OF FUNGAL MYCELLIUM

Gerald L. Solomons, High Wycombe, and Gerald W. Scammell, Chinnor, both of England, assignors to Ranks Hovis McDougall Limited, London, England

Continuation of Ser. No. 414,102, Nov. 8, 1973, abandoned, which is a continuation of Ser. No. 140,303, May 4, 1971, abandoned. This application Aug. 5, 1976, Ser. No. 711,964

Claims priority, application United Kingdom, May 14, 1970, 23452/70; June 24, 1970, 30584/70

Int. Cl.² C12B *1/00*; A23L *1/28*

U.S. Cl. 426—60 **17 Claims**

1. An article of manufacture comprising a nonviable edible non-toxic fungal mycelium of a non-toxic strain of Fusarium possessing a high net protein utilization value of the order of 65 or above based on α-amino nitrogen.

4,061,782

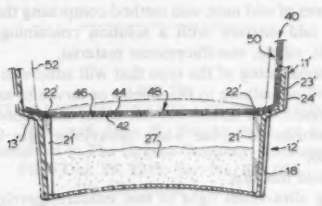
BEVERAGE PACKAGE CUP

Gerald M. Baxter, Don Mills, Canada, assignor to Redimix Beverages Limited, Toronto, Canada

Continuation-in-part of Ser. No. 580,609, May 27, 1975, abandoned. This application Dec. 22, 1976, Ser. No. 753,114

Int. Cl.² B65B *29/06*

U.S. Cl. 426—86 **5 Claims**



1. A beverage package cup comprising:

a disposable drinking cup body having upper and lower portions of frusto-conical shape, and an outwardly directed annular flange disposed between and connecting said upper and lower portions, said lower portion including a base and an upwardly-divergent side wall, said annular flange being inclined upwardly from said lower portion to said upper portion and defining an annular upper edge with said lower portion, and said upper portion including an upwardly-divergent side wall;

a dry beverage ingredient disposed in said lower portion of the cup body; and,

a removable cap hermetically sealing the beverage ingredient in said lower portion of the cup body, the cap comprising: a closure portion which is flexible and at least substantially impervious to moisture, and having its peripheral margin hermetically sealed to said annular flange of the cup body and extending across said lower portion of the cup so as to protect the beverage ingredient from deterioration due to contact with ambient air and moisture; and a pull-tab accessible from within the said upper portion of the cup body and arranged so that the cap can be detached from said annular flange by pulling on said tab;

said lower portion of the cup body additionally including a plurality of inwardly directed lugs disposed at spaced positions around the side wall of the lower cup body portion and each defining an upper end face disposed generally even with said annular upper edge of said lower portion and immediately below said cap so that, when a second similar cap is stacked inside the first, said lugs support the second cup through the intermediary of said cap and thereby prevent excessive inward displacement of the second cup and penetration of the hermetic seal by dislodgement of the sealing cap.

4,061,783

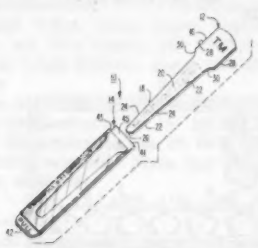
PACKAGED UNITS AND METHOD OF MAKING SAME

Louis S. Hoffman, Evans Farm Road, Morristown, N.J. 07960, and Robert B. McClosky, P.O. Box 208, Little Falls, N.J. 07424

Continuation-in-part of Ser. No. 488,532, July 15, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,701

Int. Cl.² A65B *5/04, 25/00*

U.S. Cl. 426—87 **84 Claims**



1. A packaged unit including a thin, substantially flat utensil having an upper gripping end and a lower end, having a different configuration than said upper end, extending downwardly therefrom, said lower end being integral with and longer than said gripping end, said lower end being interactable with a fluid and being in a protective sheath which includes (a) a substantially flat rigidifying member of substantially the same thickness as the lower end of the utensil and having a recess extending inwardly from an upper margin for receiving the lower end of said utensil, and (b) flexible sheet material adhered to opposed flat surfaces of the rigidifying member and overlying the recess and opposed flat surfaces of the lower end of the utensil.

53. A method of forming a packaged unit including a thin, substantially flat utensil in a protective sheath, said packaged

unit being formed from a thin, substantially flat substrate and flexible sheet material; said method comprising the steps of:

A. cutting the substrate inwardly of marginal ends thereof to form a thin, substantially flat utensil surrounded by portions of the substrate constituting a rigidifying member of the protective sheath; and

B. adhering the flexible sheet material to the rigidifying member in overlying relationship with the utensil to form, with said rigidifying member, the protective sheath.

4,061,784

SHAPED TEXTURED PROTEIN FOOD PRODUCT

Rudolph William Youngquist, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 506,078, Sept. 16, 1974, Pat. No. 3,953,611. This application Dec. 8, 1975, Ser. No. 638,873

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.[2] A23J *1/14*; A23L *1/36*

U.S. Cl. 426—93 **6 Claims**

1. A protein food product comprising edible textured protein particles in a non-heatset binder consisting of 7S soybean protein isolate.

4,061,785

METHOD AND DEVICE FOR PRESERVING VEGETABLES

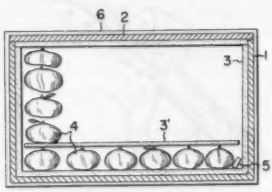
Tetsuya Nishino, 8643, Ikuta, Kawasaki, Kanagawa, and Shigeyuki Yasuda, 3-25-18 Setagaya, Setagaya, Tokyo, both of Japan

Continuation of Ser. No. 310,979, Nov. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 30,865, April 22, 1970, abandoned. This application Oct. 17, 1975, Ser. No. 624,129

Claims priority, application Japan, Apr. 26, 1969, 44-322450; Nov. 1, 1969, 44-103431[U]; Nov. 1, 1969, 44-103432[U]

Int. Cl.[2] B65B *61/22*

U.S. Cl. 426—124 **17 Claims**



1. A package assembly for the preservation of vegetables to be placed therein, comprising a container with wall means, at least a layer of which consists of plastic material to be sealed after the vegetables are inserted thereinto, for isolating the inside of the container from the outside air to the extent of preventing the introduction of moisture and bacteria while permitting some air permeation, said container containing therein a highly moisture and shock absorbent material capable of preventing the formation of dew from the water emitted by the vegetables, said absorbent material being composed of processed pulp cotton, and a preservative located in the container, in an amount sufficient to prevent the propagation of primary bacteria within the container when the vegetables are present therein.

4,061,786

DYED EDIBLE FOOD CASINGS

Bruno Winkler, Weinheim-Oberflockenbach; Bernd Mangel, Waldmichelbach, and Dieter Fritz, Weinheim, all of Germany, assignors to Naturin-Werk Becker & Co., Weinheim, Germany

Division of Ser. No. 505,444, Sept. 12, 1974, Pat. No. 3,943,262. This application Feb. 18, 1976, Ser. No. 659,051

Claims priority, application Germany, Mar. 11, 1974, 2411587

The portion of the term of this patent subsequent to Mar. 9, 1993, has been disclaimed.

Int. Cl.[2] A22C *13/00*

U.S. Cl. 426—138 **18 Claims**

1. A dyed edible food casing produced by the process which comprises:

a. applying an edible dye to an edible carrier therefor in finely divided form so that the dye coats the carrier particles,

b. fixing the dye on the carrier particles by contacting the coated carrier particles with a protein from the group consisting of gelatin, collagen and casein for complex formation whereby the dye becomes fixed on the carrier, and thereafter,

c. admixing the carrier coated with the dye with an edible casing material to form an extrudable composition, and,

d. extruding the resulting admixture to form the dye casing.

4,061,787

COLLAGEN COMPOSITIONS HAVING CROSSLINKING AGENT INCORPORATED THEREIN AND THE METHOD OF PREPARING THE SAME

Thomas Engel Higgins, Brookfield, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 15, 1976, Ser. No. 666,612

Int. Cl.[2] A22C *13/00*

U.S. Cl. 426—140 **19 Claims**

1. A homogeneous formable collagen composition having uniformly incorporated therein at least about 0.5% by weight up to about 15% by weight based on the solids content thereof of a crosslinking agent selected from the group consisting of unsaturated fatty acids having more than two double bonds, tri-fatty acid esters of glycerol and unsaturated fatty acids having more than two double bond, natural oils containing fatty acid esters with at least 11% by weight of the fatty acid residues thereof having more than two double bonds, fatty acid esters of an unsaturated fatty acid and an unsaturated fatty alcohol, and mixtures of the same.

4,061,788

WORM DETECTION PROCESS

Malcolm R. Wommack, 603 N. Pearl, Comanche, Tex. 76442

Filed Dec. 15, 1975, Ser. No. 640,586

Int. Cl.[2] A23L *3/28*

U.S. Cl. 426—248 **16 Claims**

1. A method of processing a mixture of shelled nuts and worms or larvae in order to detect said worms or larvae in said mixture for separation therefrom, said mixture containing broken pieces of said nuts, said method comprising the steps of:

coating said mixture with a solution containing a water soluble, edible, non-fluorescent material,

said material being of the type that will adhere to said nuts but will not adhere to the worms or larvae to any significant extent and hence will not affect the fluorescense of said worms or larvae when ultraviolet light is applied thereto,

drying said mixture,

applying ultra-violet light to said mixture thereby causing said worms or larvae to fluoresce whereby said worms or larvae may be readily detected, and

separating the detected worms or larvae from said nuts.

4,061,789

PROCESS OF SIMULATING A LEAN AND FAT MEAT PRODUCT

Gregory Noel Warren, Wodonga, Australia, assignor to Uncle Ben's of Australia Pty. Ltd., Wodonga, Australia

Filed Aug. 4, 1975, Ser. No. 601,601
Claims priority, application Australia, Aug. 6, 1974, 8439/74
Int. Cl.[2] A23L *1/275;* A23J *3/00*
U.S. Cl. 426—250 5 Claims

1. A process for producing a food product having portions simulating in colour the appearance of lean meat and other portions simulating in colour the appearance of fat, comprising the steps of compounding together, with heating sufficient at least to pasteurize, a first portion of food components incorporating a material imparting to the first portion a colour simulating that of lean meat; compounding together, with heating sufficient at least to pasteurize, a second portion of food components incorporating a material imparting to the second portion a colour simulating that of fat, at least one of said portions containing protein, thereafter cooling the said portions so as to establish, between the cooled portions, a temperature difference of 5°–25° C.; and commingling the differentially-temperatured portions at a temperature below about 50° C., whereby the coloured portions are cohesive one to the other without excessive deleterious bleeding therebetween.

4,061,790

CONTINUOUS DOUBLE COATING-NATURAL CEREAL

Keith M. Cole, Jr., Battle Creek, Mich., assignor to General Foods Corporation, White Plains, N.Y.

Filed Nov. 14, 1975, Ser. No. 632,136
Int. Cl.[2] A23L *1/164, 1/18*
U.S. Cl. 426—303 5 Claims

1. In a continuous process of coating an admixture of combined comestible particles of substantially differing size, shape and density and wherein particles are first contacted by an oleoagineous coating spray in a first zone and thereafter by a dilute sweet syrup in a second zone to overcoat the fat-coated particles issuing from the first zone and effect agglomeration thereof, the improvement which comprises continuously effecting the coating in each said zone in an enclosed screw conveyor means having a length to radius (L/R) ratio of at least 10 to 1, said conveyor having cut and folded screws flights therewithin with the number of cuts and folds being sufficient in number to effect tumbling and reblending of materials both before and after spray application, and said admixture being charged at a rate sufficient in relationship to the rotational rate of said screw within the chamber space in respective conveyors to assure that materials undergoing coating occupy a majority of the chamber space intermediate the conveyor wall and the screw shaft, said conveyor screw flights being proximate and circumjacent the conveyor chamber walls, only a minor fraction of the syrup moisture evaporating during coating in said second zone.

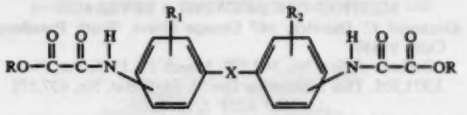
4,061,791

ANTI-ALLERGIC OXANILATE COMPOUNDS

Charles M. Hall, and John B. Wright, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

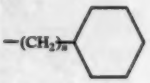
Filed Dec. 29, 1975, Ser. No. 645,024
Int. Cl.[2] A61K *31/275*
U.S. Cl. 424—304 26 Claims

1. A pharmaceutical composition which comprises as the sole active ingredient an anti-asthma, allergic rhinitis, urticara, or food allergy effective amount of a compound of the formula



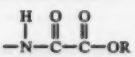
wherein

R is selected from the group consisting of hydrogen, a physiologically acceptable metal or amine cation, alkyl of one to six carbon atoms, inclusive, and

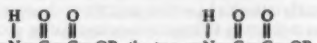


wherein n is 0, 1 or 2;

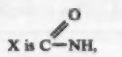
R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, halogen, nitro, cyano and



with the proviso that when one or both of R_1 and R_2 are



groups on a phenylene ring are not ortho to each other; and



in association with a pharmaceutical carrier.

4,061,792

METHOD OF MANUFACTURING A BEVERAGE CONTAINING FRUIT INGREDIENTS

Kaoru Inagami, Tokyo; Isamu Mitsui, Yokohama; Chomatsu Nakamura, and Toru Nozaka, both of Tokyo, all of Japan, assignors to Calpis Shokuhin Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 448,992, March 7, 1974, abandoned, which is a continuation of Ser. No. 206,450, Dec. 9, 1971, abandoned. This application Dec. 10, 1975, Ser. No. 639,435
Claims priority, application Japan, Dec. 17, 1970, 45-112855; Oct. 19, 1971, 46-082097
Int. Cl.[2] A23L *2/30, 2/00*
U.S. Cl. 426—330.2 4 Claims

1. A method for manufacturing a fruit beverage which is obtained by blending acidified milk with grape juice or grape extract comprising:

a. providing grape juice or grape extract containing tannin,
b. mixing said grape juice or grape extract with an acidified solution of casein having a pH not exceeding 3.7,
c. removing coagulums resulting from said mixing and
d. blending said grape juice or grape extract with acidified milk.

3. A fruit beverage which is coagulum-free and which remains stable for a long time which is obtained by blending acidified milk with grape juice or grape extract wherein, before blending, said grape juice or grape extract is treated as follows:

a. providing grape juice or grape extract containing tannin,
b. mixing said grape juice or grape extract with an acidified solution of casein having a pH not exceeding 3.7, and
c. removing coagulums resulting from said mixing.

4,061,793

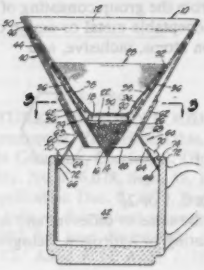
METHOD FOR BREWING A BEVERAGE

Alexander C. Daswick, 647 Orange Grove, South Pasadena, Calif. 91030

Division of Ser. No. 562,707, March 27, 1975, Pat. No. 3,971,305. This application Dec. 3, 1975. Ser. No. 637,172

Int. Cl.[2] A23F *1/08, 3/02*

U.S. Cl. 426—433 2 Claims



1. A method for brewing coffee or tea, comprising the steps of:

a. packaging a pre-selected quantity of coffee grounds or tea leaves in the bottom portion of a water permeable filter,

b. movably attaching, within said filter element, a buoyant, water deflecting element above said coffee grounds or tea leaves,

c. positioning the lower end of said filter element above a liquid receiving container, and

d. pouring hot water into said filter element onto said water deflecting element, whereby said water is not poured directly upon said coffee grounds or tea leaves.

4,051,794

METHOD FOR FORMING BLOCKS OF NATURAL CHEESE FROM CHEESE CURD

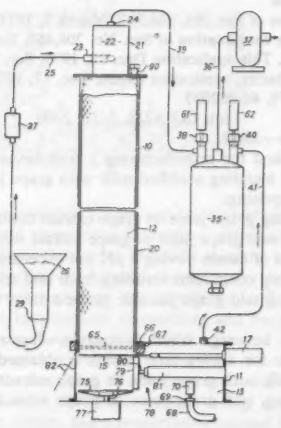
George Kenneth Charles, Wincanton, England, assignor to Wincanton Engineering Limited, London, England

Filed Apr. 2, 1976, Ser. No. 672,953

Claims priority, application United Kingdom, Apr. 4, 1975, 14002/75

Int. Cl.[2] A23C *19/02*

U.S. Cl. 426—486 5 Claims



1. In a method of forming blocks of cheese from crumbled cheese curd comprising feeding the crumbled curd into a chamber to form a pillar of curd in said chamber, the curd in the lower portion of said pillar being compressed by the weight of superimposed curd to press out whey therefrom and consolidate the curd, extracting air and whey from said chamber so as to maintain a sub-atmospheric pressure therein during feeding of the curd into the chamber whereby air introduced into the chamber with the curd is "flashed off" before the curd is deposited on the top of said pillar, lowering said pillar, severing the lower end of said pillar of curd to form a block of cheese and continuing the feeding, lowering and severing operations: the improvement comprising subjecting the bottom of said pillar to a lower gaseous pressure than the gaseous pressure acting on the top of said pillar during the lowering of the pillar of curd so that the resulting differential gaseous pressure exerts a force on said pillar of curd urging said pillar downwards.

4,061,795

USES OF α-OXY(OXO) SULFIDES AND ETHERS IN FOODSTUFFS AND FLAVORS FOR FOODSTUFFS

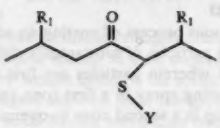
William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 730,537, Oct. 7, 1976. This application Feb. 4, 1977, Ser. No. 765,636

Int. Cl.[2] A23L *1/226, 1/235*

U.S. Cl. 426—535 4 Claims

1. A process for augmenting or enhancing the taste or aroma of a foodstuff comprising the step of adding to said foodstuff from about 0.1 ppm up to about 50 ppm by weight of said foodstuff of an alpha oxosulfide compound having the structure:



wherein R_1 is hydrogen or methyl and Y is acetyl.

4,061,796

USES OF α-OXY(OXO) SULFIDES AND ETHERS IN FOODSTUFFS AND FLAVORS FOR FOODSTUFFS

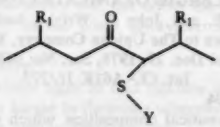
William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 730,537, Oct. 7, 1976. This application Feb. 4, 1977, Ser. No. 765,634

Int. Cl.[2] A23L *1/226, 1/235*

U.S. Cl. 426—535 4 Claims

1. A process for augmenting or enhancing the taste or aroma of a foodstuff comprising the step of adding to said foodstuff from about 0.1 ppm up to about 50 ppm by weight of said foodstuff of an alpha oxosulfide compound having the structure:



wherein R_1 is hydrogen or methyl and Y is 1,3-diethylacetonyl.

4,061,797

NONCARBONATED, CAFFEINE-CONTAINING FRUIT AND COLA FLAVORED BEVERAGE

Harry Hannan, Jr., and Primrose D. Hannan, both of 1007 Pinar Drive, Orlando, Fla. 32807

Filed Aug. 22, 1975, Ser. No. 606,833
Int. Cl.[2] A23L 2/26
U.S. Cl. 426—590 15 Claims

1. An aqueous, storage stable, noncarbonated, caffeine-containing beverage consisting essentially of fruit and cola flavoring and an edible acid, said fruit flavoring consisting of a concentrated fruit-flavoring in an effective amount by weight or a fruit juice in an amount between about 6.3-34.35% by weight, said fruit flavoring being added to overcome the unpalatable constituents of said cola flavoring, said amount of fruit flavoring being less than an amount which overcomes said cola flavoring so as to render a palatable, noncarbonated beverage having a distinct fruit and cola flavoring.

4,061,798

METHOD FOR PREPARING HARD BUTTERS FROM PALM OIL

Junji Kanegae, 38-90, Nishikanenoi, Showa-cho, Kitakatsushika, Tokyo; Tsugio Izumi, 3-302, Midejntaku, 280, Tsuruhara, Izumisano, Osaka, and Akio Mandai, 22-8, Asahimachi, Izumiotsu, Osaka, all of Japan

Filed Sept. 22, 1976, Ser. No. 724,821
Int. Cl.[2] A23D 5/00
U.S. Cl. 426—607 14 Claims

1. A process for preparing a hard butter from palm oil, said method comprising hydrogenating a soft palm oil fraction having an iodine value of at least 55 with a conventional hydrogenation catalyst in the presence of a catalytically effective amount of methionine to thereby form a hardened product containing at least 40% of trans-isomers.

4,061,799

METHOD OF PATTERNING STYRENE DIENE BLOCK COPOLYMER ELECTRON BEAM RESISTS

Terry L. Brewer, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 412,930, Nov. 5, 1973, abandoned. This application Sept. 22, 1975, Ser. No. 615,447
Int. Cl.[2] B44C 1/22; C03C 15/00; B05D 3/06
U.S. Cl. 427—43 8 Claims

1. The method of forming a patterned negative high energy beam resist, comprising the steps of:

a. forming a thin film of a styrene-diene block copolymer on a support;

b. scanning said thin film with a high energy beam in a predetermined pattern requiring resolutions of less than 1 micron at a speed of at least 5×10^{-6} coulombs per cm^2 to cause the irradiated portion of said copolymer to cross link where irradiated by said high energy beam; and,

c. dissolving the uncross linked portion of said copolymer with a solvent which dissolves and removes the uncross linked copolymer, thereby leaving said cross linked portion of said copolymer on said support with openings in a desired pattern.

4,061,800

VAPOR DESPOSITION METHOD

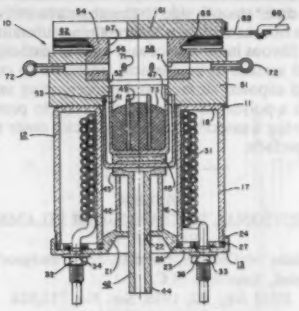
Emmett R. Anderson, Los Gatos, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 547,717, Feb. 6, 1975, abandoned. This application Jan. 27, 1976, Ser. No. 652,774
Int. Cl.[2] B05D 3/06
U.S. Cl. 427—46 6 Claims

1. In a method for effecting vapor deposition of a material on an object, the steps of:

A. heating the material in a chamber isolated from the object to vaporize the material;

B. maintaining the chamber in a sealed condition and heating the vaporized material to an elevated temperature and pressure to form a vapor of high kinetic energy; and



C. opening the chamber to effect a rapid release of the highly pressurized vapor from the chamber to the object.

4,061,801

METHOD OF PRODUCING ALUMINUM OR ALUMINUM ALLOY COATED STEEL SHEETS WITH AID OF POWDER METHOD

Motoharu Hamada, and Shunichi Harada, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed June 30, 1976, Ser. No. 701,105
Claims priority, application Japan, July 19, 1975, 50-87857
Int. Cl.[2] C23C 9/00; C23B 5/50
U.S. Cl. 427—192 11 Claims

1. A method of producing an aluminum or aluminum alloy coated steel sheet with the aid of powder method, comprising preliminarily electroplating a zinc coating having a thickness of 0.01 to 0.3 μm to a steel sheet surface, applying an aluminum powder to the zinc coated steel sheet, and subjecting to the coated steel sheet steps of heating, rolling and heating again.

4,061,802

PLATING PROCESS AND BATH

Francis E. Costello, 7 Madison Ave., Laurel Springs, N.J. 08084

Continuation of Ser. No. 588,725, Oct. 24, 1966, abandoned, and a continuation-in-part of Ser. No. 504,192, Oct. 23, 1965, abandoned. This application Jan. 7, 1976, Ser. No. 647,001
Int. Cl.[2] C23C 3/02
U.S. Cl. 427—304 43 Claims

1. An electroless nickel bath for applying a nickel coating to articles comprising about ¾ gallon of water, about 320 cc. of ammonium hydroxide, about 3¼ ounces of nickel sulphate, about 8 ounces of nickel chloride, about 12 ounces of sodium hypophosphite to provide the reducing agent anions for reducing the nickel ions to a metal and about 19¼ ounces of sodium citrate and about 13¼ ounces of ammonium chloride as the stablizing agent for controlling the operating speed of the reducing agent, the bath having a pH of about 8.5, and the ratio by weight of nickel ions to reducing agent anions being about 1 to 2.7.

4,061,803

LEATHER BELTS OR APRONS FOR TEXTILE MACHINES

Wallace Ronald Brooksbank, Croft House, Hetton, Skipton, and David Toft, 6 Brackenley Drive, Embsay, both of North Yorkshire, England

Filed Mar. 9, 1976, Ser. No. 665,189
Int. Cl.[2] B05D 3/00, 3/02, 3/12
U.S. Cl. 427—323 5 Claims

1. A method for the production of a relatively thin leather

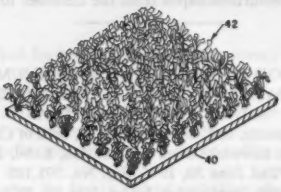
belt or apron for conveying textile fibres on textile machines from natural leather having an outer smooth non-fibrous side and an inner fibrous side which comprises the steps of removing from said natural leather a layer of substantial depth at the non-fibrous outer smooth side to thereby outwardly expose an intermediate fibrous surface while retaining substantially intact the original fibrous inner side of said natural leather, subjecting said exposed surface to mechanical treatment to compact the fibres at said exposed surface, and impregnating said exposed surface with a polymeric material, whereby to produce a belt or apron having a smooth flexible non-tacky outer textile fiber conveying surface.

4,061,804

NON-DIRECTIONAL RECTANGULAR FILAMENTS AND PRODUCTS

Walter Graham McCulloch, Candler, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Aug. 12, 1976, Ser. No. 713,954
Int. Cl.² B32B *33/00*
U.S. Cl. 428—17 **25 Claims**



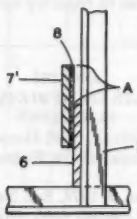
15. A cut-pile synthetic turf product wherein the pile is formed of ribbon filaments of at lest 100 denier each, having a substantially rectangular cross-sectional configuration and characterized by major and minor axes which impart a directional flexibility to the filament, each of said filaments having a plurality of folds wherein both the major and minor axes bend simultaneously, said folds being randomly oriented with respect to one another to overcome the natural directional flexibility of the rectangular cross-section and impart non-directional flexibility to the filaments, said turf having an essentially uniform, flat pile surface giving a non-directional response to objects rolled thereon, due to the universal flexibility of the filaments forming said surface.

4,061,805

PRESSURE SENSITIVE ADHESIVE STRIPS AND SHEETS

James Thomas Thompson, and Kenneth Hon Seto, both of Dayton, Ohio, assignors to Protective Treatments, Inc., Dayton, Ohio

Continuation of Ser. No. 347,823, April 4, 1973, Pat. No. 3,896,245. This application June 20, 1975, Ser. No. 588,861
The portion of the term of this patent subsequent to July 22, 1992, has been disclaimed.
Int. Cl.² B32B *25/02, 25/14, 27/20*
U.S. Cl. 428—31 **5 Claims**



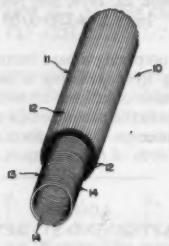
1. A permanently compressible pressure sensitive composite strand in the form of a ribbon adapted for attachment to an automobile body and constituted by a tacky permanently compressible, nonporous cohesive material, said ribbon having little or no resilience and constituted by elastomeric material compounded with from 0.45 to 2.5 times the weight of elastomeric material of low volatile liquid plasticizer and finely divided solids in an amount of at least 0.93 parts per part of elastomeric material, the finely divided solids including from 0.5 to 2½ parts, per part of elastomeric material, of finely divided bulk fibrous solids or solids that form thixotropic mixtures with the said liquid plasticizer, said ribbon being coated with a pressure sensitive adhesive, and said base strand being permanently deformable by pressure above about 15 pounds per square inch, but exhibiting negligible flow at 0.6 pounds per square inch pressure.

4,061,806

FLEXIBLE HOLLOW FISHING ROD

James Monroe Lindler, Lexington, and Michael Taras Romanyszyn, Jr., Columbia, both of S.C., assignors to Shakespeare Company, Columbia, S.C.

Filed Apr. 12, 1976, Ser. No. 675,713
Int. Cl.² B32B *7/02, 17/12*
U.S. Cl. 428—35 **5 Claims**



1. A flexible hollow fishing rod shaft of circular cross section having only two layers, an outer layer comprising at least longitudinally extending fiber glass filaments bonded together with a flexible plastic resin, and an inner layer of graphite filaments wound in a tight helix and impregnated with a flexible plastic resin, the radial thickness of the fiber glass layer being approximately seven to eleven times the thickness of the graphite layer.

4,061,807

ADSORBENT BODY AND METHOD FOR MAKING SAME

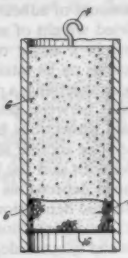
Amos J. Shaler, 705 W. Park Ave., State College, Pa. 16801, and Daniel C. McLean, 4029 Alicante, Fort Worth, Tex. 76133

Filed Feb. 9, 1976, Ser. No. 656,551
Int. Cl.² B01D *27/04;* B01J *1/06*
U.S. Cl. 428—36 **7 Claims**

1. A porous adsorbent body comprising an array of granules of adsorbent material and particles of nylon having a size from about 200 to 600 mesh bonded to said granules with at least some of said particles bridging between contiguous granules and bonding them together at discrete regions to form a self-sustaining body, said granules having a size of from about 8 to 60 mesh and defining interstices which open into each other between said regions for admission of fluid to the surface of the granules in the interior of said body, the ratio between the amounts of the adsorbent granules and the particulate nylon being within the range of from about 60 to 95 parts by volume of the granules to from 5 to 40 parts by volume of the particulate nylon.

4. A porous adsorbent body as set forth in claim **1** wherein

an exterior surface of said body has secured thereto means for sealing the body in a container.



6. A porous adsorbent body as set forth in claim 4 wherein said means is a hollow sleeve of stretchable material having an inlet for the admission of fluid under pressure to the interior of the sleeve thereby to cause expansion thereof.

4,061,808

COMPOSITE LABEL STRIP FOR USE WITH LABEL APPLYING APPARATUS

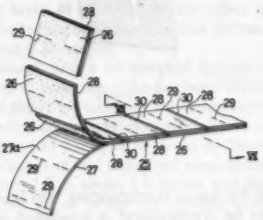
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Apr. 12, 1976, Ser. No. 675,717

Claims priority, application Japan, Apr. 14, 1975, 50-49199[U]

Int. Cl.² B65D *65/28;* G09F *3/00*

U.S. Cl. 428—42 **8 Claims**



1. A composite label strip structure comprising:

a label strip extending in a longitudinal direction and having a top side and an underside;

a backing strip that is oriented to extend in said longitudinal direction and that is substantially coextensive in shape and in placement with said label strip; said backing strip having a surface that is releasably adhered to said underside of said label strip;

said label strip having a plurality of cuts therethrough extending from said top side to said under side thereof, each said cut extending transversely of said longitudinal direction of extension of said label strip; said cuts being spaced at predetermined intervals along said label strip in said longitudinal direction; at said cuts, said label strip is separable into a series of labels;

the composite structure of both said label strip and said backing strip having common through perforations, each extending from said backing strip bottom side and continuing through said backing strip to the top side thereof; and each converging into said label strip; for each said label, there is at least one row of said perforations, and each said row of perforations extending transversely of said longitudinal direction of extension of said label strip; all said rows of perforations through the composite strip structure being spaced longitudinally away from said cuts between labels.

4,061,809

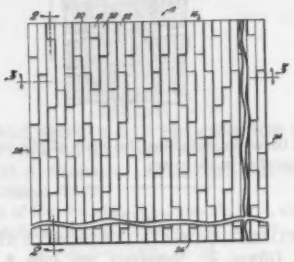
DECORATIVE PANEL OF WOOD STRIPS HAVING SECTIONS OF VARYING THICKNESS

Edward J. Mautner, 7937 West Drive, Miami Beach, Fla. 33141

Filed Feb. 11, 1977, Ser. No. 767,909

Int. Cl.² B32B *3/14, 3/16*

U.S. Cl. 428—50 **2 Claims**



1. A decorative panel comprising a backing board and a plurality of equiwidth rows of wood strips of a common length equal to the length of the backing board and of a number such so as to completely cover the panel and wherein the rows comprise a plurality of strips in abutting relation to one another with adjacent strips being of a different thickness.

4,061,810

FLAME-RETARDANT CARPET AND COMPOSITION FOR PREPARING THE SAME

Pritam Singh Minhas, Mendham, N.J., and Bernard Sukornick, Williamsville, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Sept. 27, 1976, Ser. No. 727,072

Int. Cl.² B32B *3/02, 33/00*

U.S. Cl. 428—85 **50 Claims**

1. A flame retardant carpet having a relatively pliable primary backing and a tufted surface, said surface being comprised of fibers selected from the group consisting of polyester and polyamide fibers, said carpet having from about 1 to 15 weight percent of a composition added thereto, said composition comprising:

a. about 10 to about 90 weight percent of a polyvalent metal compound selected from the group consisting of oxides and hydroxides of tin, antimony, aluminum and zinc; and

b. about 10 to about 90 weight percent of a hydroxycarboxylic acid selected from the group consisting of malic acid, citric acid, tartaric acid, gallic acid, and 2,4-dihydroxybenzoic acid.

4,061,811

ANTISTATIC CARPET AND PRODUCTION THEREOF

Hideo Takase, Shiga; Toyota Ishii, and Shiro Nishiumi, both of Ohtsu, all of Japan, assignors to Toray Industries Inc., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,819

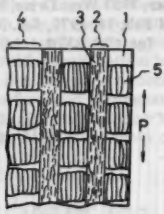
Claims priority, application Japan, Mar. 5, 1975, 50-26462; Mar. 5, 1975, 50-26457; Oct. 21, 1975, 50-142565[U]

Int. Cl.² B32B *3/02;* B05D *3/12*

U.S. Cl. 428—95 **12 Claims**

1. An antistatic pile carpet comprising a primary backing of a base cloth, a plurality of rows of pile yarn tufted through the base cloth and a backing layer of a latex having carbon fibers

dispersed therein, said carbon fibers having a diameter of from 4μ to 26μ and a length of from 0.05 mm to 30 mm and being



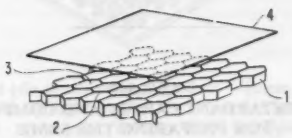
positioned between and along the rows of pile yarn and being arranged parallel to the rows.

4,061,812

HONEYCOMB-LAMINATE COMPOSITE STRUCTURE

William J. Gilwee, Jr., Sunnyvale, and John A. Parker, Los Altos, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 22, 1976, Ser. No. 698,646
Int. Cl.² B32B *3/12*
U.S. Cl. 428—117 **12 Claims**



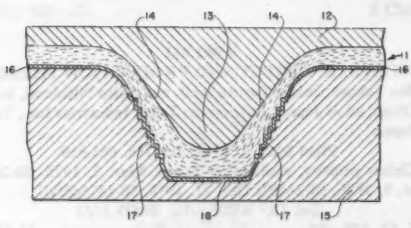
1. A honeycomb-laminate composite structure comprising
a. a cellular core of a polyquinoxaline foam in a honeycomb structure, said foam having a density within the range of about 1.5 to about 5 lb/ft³, and
b. a layer of a non-combustible fibrous material impregnated with a polyimide resin laminated thereon.

4,061,813

COMBINATION SHEATHING SUPPORT - MEMBER BUILDING PRODUCT

Robert L. Geimer, Verona, and William F. Lehmann, Madison, both of Wis., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 478,284, June 11, 1974, abandoned. This application June 14, 1976, Ser. No. 695,623
Int. Cl.² B32B *3/00, 5/16*
U.S. Cl. 428—183 **4 Claims**



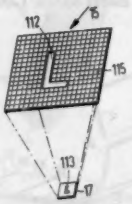
1. A combination sheathing-support member building product which incorporates both framing and sheathing into an integral unit for use in roof, floor, or wall applications in constructing frame buildings, said product comprising a mixture of cellulosic particles having a bulk density of from 2 to 7 pounds per cubic foot and an amount of adhesive binder of from 3 to 8 percent of the ovendried weight of said particles, said mixture being press-molded in a single operation into a panel having smooth, flat sections on its interior and exterior sides, said flat sections serving as sheathing; a plurality of parallel and evenly spaced projections between said flat sections on said interior side, each of said projections being a pair of stepped sidewalls inclined toward one another and culminating in a flat bottom which is parallel with said flat sections; a plurality of parallel and evenly spaced depressions between said flat sections on the exterior side, said depressions being directly opposite of, and aligned with, said projections on the interior side; and interior projections and exterior depressions extending an entire dimension of said panel, thus forming a plurality of channels in said panel, said channels serving as support members giving strength and support of conventional 2 by 4 stud-and-sheathing construction to the panel.

4,061,814

METHOD AND MASKING STRUCTURE FOR CONFIGURATING THIN LAYERS

Alfred Politycki, Ottobrunn, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 1, 1975, Ser. No. 564,105
Claims priority, application Germany, Apr. 3, 1974, 2416186
Int. Cl.² B32B *3/10*
U.S. Cl. 428—196 **8 Claims**



1. A mask for use in configurating thin layers, wherein the thin layer to be configurated is irradiated with an electron beam passing through such mask to obtain a configuration on such layer corresponding to the configuration of a masking member carried by such mask, comprising a masking member of thin metal, and a supporting structure for said masking member comprising a plurality of series of fine supporting elements, the elements of each series extending in the same direction and traverse to the direction of another series, said series being interconnected at their intersection to form a mesh-like structure, the elements thereof each being of a width, in transverse cross-section, which is sufficiently small, that in use stray radiation of the electron beam within the thin layer will completely radiate the geometric shadow areas of the supporting elements thereon.

4. A method for configurating thin layers, wherein the thin layer to be configurated is irradiated with an electron beam passing through a mask to obtain a configuration on such layer corresponding to the configuration of selected portions of such a mask, comprising the steps of positioning the layer to be configurated in the path of an electron beam for irradiation thereby, interposing a masking member, which is impermeable to the electron beam and has a desired configuration, on such beam path between the source of such electron beam and said layer, supporting said masking member by means of relatively very fine supporting elements which extend over areas of the mask which are to be permeable to the electron beam, and spacing the masking member so supported, relative to the layer to be configurated, a distance such that in consideration with the employed widths of the fine supporting elements and pa-

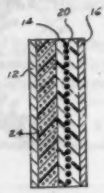
rameters with respect to the relative sizes of the masking member and film configuration structures, that stray radiation of the electron beam within the thin layer completely radiates the geometric shadow areas of the fine supporting elements thereon.

4,061,815

NOVEL COMPOSITIONS

Robert E. J. Poole, Jr., Newport Beach, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 26, 1967, Ser. No. 678,425
Int. Cl.[2] F41H *1/02, 5/04;* B32B *5/24*
U.S. Cl. 428—215 16 Claims



1. A laminated sheet characterized by high impact resistance which comprises, in combination, a multiplicity of layers of sheet material, each layer being bonded to the next adjacent layer at the common interface thereof;

the outermost layer of material on the one side being selected from the class consisting of metal sheet and fiberglass reinforced resin having a thickness from about 0.50 to about 1.5 inches;

the outermost layer of material on the other side being a retaining skin having a thickness within the range of about 0.125 to about 0.25 inches;

the said outermost layers of material having sandwiched therebetween at least one layer having a thickness within the range of about 1.0 to about 4.0 inches fabricated from an elastomeric non-cellular polyurethane having a hardness from about 95 Shore A to about 60 Shore D;

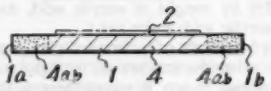
the overall thickness of said laminated sheet being within the range of about 2.0 to about 5.0 inches and the weight of said laminated sheet being not greater than about 35 pounds per square foot.

4,061,816

INTEGRALLY SINTERED CERAMIC COMPLEX AND METHOD OF MANUFACTURING THE SAME

Tomosaburo Kitamura, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 23, 1976, Ser. No. 669,516
Claims priority, application Japan, Apr. 1, 1975, 50-40151
Int. Cl.[2] B32B *7/02;* C04B *35/00, 35/46*
U.S. Cl. 428—218 9 Claims



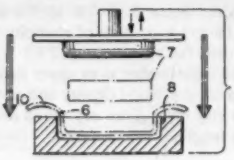
1. An integrally sintered ceramic complex, comprising: a first piezoelectric ceramic portion; and a second ceramic portion; said first and second portions having a common external surface, said first and second ceramic portions being sintered integrally so that a boundary layer is formed between said first and second portions, the ratio of the theoretical density to the sintered density of said first ceramic portion being selected smaller than the same ratio of said second ceramic portion, and the ratio of the theoretical density to the sintered density in the boundary layer gradually increased from the ratio of said first portion to the ratio of said second portion so that ultrasonic waves propagating in said first piezoelectric portion are effectively reduced in the boundary layer and said second portion.

4,061,817

LUGGAGE SHELLS AND PROCESS FOR THE MANUFACTURE THEREOF

John M. Maxel, St. Charles, Ill., assignor to Armco Steel Corporation, Middleton, Ohio

Continuation of Ser. No. 483,793, June 27, 1974, abandoned.
This application June 30, 1975, Ser. No. 591,493
Int. Cl.[2] A45C *13/38*
U.S. Cl. 428—246 5 Claims



1. An article of luggage including in combination a molded three-dimensional self-supporting luggage shell consisting essentially of a glass fiber reinforced thermoplastic polymer sheet containing 5% to 50% by weight glass fibers distributed therein, said shell being covered with a sheet material, said shell having a thickness of approximately 0.04 to 0.06 inch as compressed from an initial sheet stock thickness of about 0.08 to 0.15 inch and said shell having a specific gravity throughout within the range of 0.90 to 1.40, said shell as compressed having a flexural strength within the range of 5,000 to 30,000 pounds per square inch and a notched izod impact resistance within the range of 2 to 15 foot pounds per inch.

4,061,818

PRINTING BLANKET CONTAINING HIGH STRENGTH FILAMENTS

John C. Duckett, Clyde; Wayne W. Easley, Lake Junaluska, and Andrew J. Gaworowski, Waynesville, all of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Oct. 7, 1976, Ser. No. 730,412
Int. Cl.[2] B32B *7/02, 25/10, 27/02, 27/34*
U.S. Cl. 428—246 10 Claims

1. A printing blanket comprising, a base ply, a printing face, and a high strength woven layer disposed between said base ply and printing face, said woven layer being defined by warps and wefts wherein at least said warps are made of flexible synthetic filaments having a breaking tenacity ranging between 18 and 26 grams per denier and an elongation at break ranging between 3 and 5 percent, said layer having approximately half as many wefts as warps with the lesser number of wefts serving to reduce any tendency for crimping of said layer and blanket, said blanket having optimum stability and minimum elongation under operating tension.

4,061,819

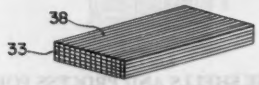
PRODUCTS OF CONVERTED LIGNOCELLULOSIC MATERIALS

Derek Barnes, Vancouver, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Continuation of Ser. No. 502,065, Aug. 30, 1974, abandoned, which is a division of Ser. No. 237,705, March 24, 1972, abandoned. This application Aug. 11, 1976, Ser. No. 713,507

Int. Cl.[2] B32B 5/12

U.S. Cl. 428—294 7 Claims



1. A discrete dimensioned structural lumber product comprising adhesively bonded, substantially straight wood strands having lengths of at least 12 inches, average widths of 0.05 inch to 0.25 inch, and average thickness of 0.05 inch to 0.5 inch, said strands being disposed, side by side lengthwise of the lumber product in substantially parallel relationship with adhesive bonding adjacent strands, the total amount of adhesive solids in said lumber product being from 1% to 5% by weight, said lumber product having a modulus of elasticity for a given dry wood density within the boundaries in FIG. 4 of the curve of western softwood clear lumber as an upper limit of modulus of elasticity for a given dry wood density and as a lower limit of modulus of elasticity for a given dry wood density the curve for 24 inch fiber length 1% resin solids.

4,061,820

SELF-ADHERING MATERIAL

Robert P. Magid, Ringoes, N.J., and Gerald Sly, Levittown, Pa., assignors to Oxford Chemicals, Incorporated, New Brunswick, N.J.

Filed Apr. 7, 1976, Ser. No. 674,598

Int. Cl.[2] B32B 3/26, 5/18; C09J 7/02

U.S. Cl. 428—311 7 Claims

7. An adhesive-containing material comprising a plastic foam material and a dry, solvent-free, permanently tacky adhesive composition, said plastic foam having a cellular structure including a surface layer of open cells, the actual surface of said foam being defined by the leading edges of the sidewalls of said surface layer of open cells, said plastic foam being sufficiently flexible such that the cell walls of said surface layer of open cells may be moved into substantial alignment with the actual surface of said plastic foam upon the application of pressure, said surface layer of open cells being coated with said adhesive composition, said adhesive composition having been applied to said plastic foam while said foam was maintained under a pressure sufficient to bring said cell walls into substantial alignment with the actual surface of said plastic film such that a substantial portion of said adhesive composition is located below the actual surface of said plastic foam in the absence of pressure on said foam, the amount of said adhesive composition being insufficient to form a continuous adhesive film on the surface of said plastic foam and insufficient to coat a substantial number of cells below said surface layer of open cells, said adhesive-containing material being incapable of adhering to any opposed surface without the application of pressure.

4,061,821

SEMIPERMEABLE COMPOSITE MEMBRANES

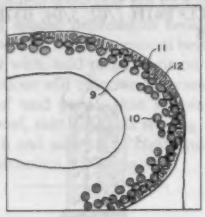
Fusakazu Hayano; Yasuo Hashino, and Kiyoshi Ichikawa, all of Fujishi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 14, 1976, Ser. No. 750,544

Claims priority, application Japan, Dec. 29, 1975, 50-156030; Dec. 30, 1975, 50-156832

Int. Cl.[2] B01D 31/00

U.S. Cl. 428—304 9 Claims



1. A semipermeable composite membrane consisting of a porous substance and a reinforcing material made of fibrous material embedded in the wall of the porous substance, at least one part of said porous substance forming a porous region of a network structure having pore sizes in the range from 500A to 5μ; said porous region containing a number of voids having diameters of 10μ or greater; and the ratio of water permeability of said membrane after one time treatment with hot water at 80° C or after drying at 20° C to the respective water permeability before said treatment being 0.3 or higher.

4,061,822

CRUSHED FOAM COATED LEATHER AND LEATHER-LIKE MATERIALS

John G. Brodnyan, Langhorne, Pa.; Donald F. Holloway, Milwaukee, Wis., and Stanley Le Sota, Horsham, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 410,837, Oct. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 123,871, March 12, 1971, abandoned. This application June 9, 1975, Ser. No. 585,146

Int. Cl.[2] B32B 3/26; B05D 5/00

U.S. Cl. 428—315 12 Claims

1. A method for preparing crushed foam coated leather and leather substitutes which comprises:

A. Foaming a latex composition prepared from monomers of the following groups:

i. 20–90% by weight of butyl acrylate, 2-ethylhexyl acrylate or ethylene;

ii. 40–95% by weight of ethyl acrylate or vinyl chloride;

iii. 20–50% by weight of methyl methacrylate, acrylonitrile, styrene or vinylidene chloride;

iv. 10–30% by weight of methyl acrylate or butyl methacrylate;

v. 0.1–5% by weight of acrylic acid, itaconic acid or methacrylic acid; and

vi. 3–7% by weight of hydroxyethyl methacrylate, methylol acrylamide, acrylamide, methylol methacrylamide or acrolein, or any mixtures thereof; the sum of i–vi being 100%;

B. Coating the foam on a leather or leather substitute at a thickness in the range of from 5 to 60 mils;

C. Partially drying the foam at a temperature in the range of from 120° to 400° F. but short of curing the foam; and simultaneously or separately:

D. Crushing the partially dried foam coating to a thickness of about 3–25 mils and such that the crushed foam coating has minimal bounce back and good pattern definition upon embossment;

E. Embossing and curing the crushed foam coated leather or leather substitute at a pressure in the range of from about 50 to 2,000 psi at a temperature in the range of from 100° to 350° F.

9. A leather or leather substitute which has a crushed foam coating of a latex composition containing a copolymer prepared from monomers of the following groups:

i. 20–90% by weight of butyl acrylate, 2-ethylhexyl acrylate or ethylene;

ii. 40–95% by weight of ethyl acrylate or vinyl chloride;

iii. 20–50% by weight of methyl methacrylate, acrylonitrile, styrene or vinylidene chloride;

iv. 10–30% by weight of methyl acrylate, butyl methacrylate;

v. 0.1–5% by weight of acrylic acid, itaconic acid or methacrylic acid; and

vi. 3–7% by weight of hydroxyethyl methacrylate, methylol acrylamide, acrylamide, methylol methacrylamide or acrolein, or any mixtures thereof; the sum of i–vi being 100%;

said crushed foam coating having a thickness of about 3–25 mils, minimal bounce back and good pattern definition upon embossment.

4,061,823

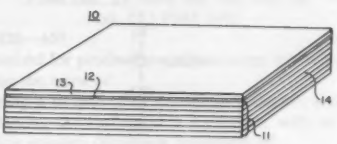
HIGHLY MACHINABLE COTTON-PHENOLIC BASE FOR DECORATIVE ASSEMBLIES

Harold O. McCaskey, Jr., Allendale, S.C., and Salvatore E. Palazzolo, Elizabeth City, N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 11, 1975, Ser. No. 639,956

Int. Cl.[2] B32B *5/02*

U.S. Cl. 428—318 **4 Claims**



1. A consolidated, unitary decorative assembly, comprising a decorative laminate, the decorative laminate having a machined surface, said decorative laminate comprising a non-abrasive, shapeable base core of a plurality of sheets, each sheet consisting of paper consisting of cotton linter fibers in felted form having lengths between about 5 mm. and about 40 mm. and diameters between about 0.010 mm. and about 0.040 mm., impreganted with a cured phenolic resin, the base core having the property of allowing machine cutting for 500 cycles per 1½' of core edge surface without cratering a 90.0 Rockwell A hardness carbide tipped shaper blade, said core having superimposed thereon a decorative print sheet impregnated with a cured thermoset resin, and an outer protective overlay sheet impregnated with a cured thermoset resin.

4,061,824

NOVEL METAL POWDERS AND MAGNETIC TAPES PRODUCED THEREWITH

Robert J. Deffeyes, and Wesley R. Tyler, both of Arlington, Tex., assignors to Graham Magnetics Incorporated, Graham, Tex.

Continuation-in-part of Ser. No. 401,636, Sept. 28, 1973, Pat. No. 3,909,240. This application Sept. 12, 1975, Ser. No. 612,708

Int. Cl.[2] C22B *23/04;* **B32B** *5/16, 15/02*

U.S. Cl. 428—328 **14 Claims**

1. A magnetic recording member of the type utilizing a composition comprising ferromagnetic metal particles in a resin binder and coated on a support member, wherein said metal particles comprise acicular particles consisting of at least 50% by weight of cobalt and characterized by the following parameters:

Squareness	of at least 0.72
Magnetic Moment	of at least 110
Coercivity	of at least 500
Increase in Coercivity Between 25° F. and −195° F	less than 100%

2. A metallic powder of small acicular metallic particles comprising at least 50% by weight of cobalt, said particles being characterized by the following characteristics:

acicularity	:	2:1
length	:	less than 2 microns
squareness	:	at least 0.72
coercive force	:	at least 500
sigma value	:	at least 110
stable sigma value of	:	at least 77.

4,061,825

WATER ACTIVATABLE TAPES

Patrick James Claude Counsell, and Sydney Robert Whitehouse, both of Stafford, Great Britain, assignors to Evode Holdings Limited, Stafford, Great Britain

Continuation of Ser. No. 587,259, June 16, 1975. This application Dec. 6, 1976, Ser. No. 747,823

Int. Cl.[2] C09J *7/02*

U.S. Cl. 428—355 **13 Claims**

1. A water-activatible tape for construction purposes which comprises a substrate of fibrous or foamed plastics material impregnated or coated with a water-reactive cementitious composition which is reactive with water to form a set mass, said cementitious composition including at least one cement and a non-water sensitive polymeric binder which binds the cement to the substrate while the tape is in its uncured state and a water-sensitive additive which is compatible with the polymeric binder and which is sufficiently water-sensitive to at least swell in contact with water.

4,061,826

FLAME-RETARDANT PRESSURE-SENSITIVE ADHESIVE COMPOSITION

Raymond J. Petras, St. Paul, and Gaylord L. Groff, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 544,964, Jan. 29, 1975, abandoned. This application June 25, 1976, Ser. No. 699,786

Int. Cl.[2] B32B *27/30;* **C09J** *3/14*

U.S. Cl. 428—356 **15 Claims**

1. A flame-retardant pressure-sensitive adhesive composition for use on electrically insulating tape that is compatable, as defined herein, with magnet wire insulation, said adhesive composition providing, when applied in a 5-mil-thickness on a polyester film backing, at least 20 ounces of adhesion to steel per inch width, and said adhesive composition comprising (1) a base pressure-sensitive adhesive material that exhibits no more than about 3 weight-percent halogen loss after weeks at 175° C and (2) at least 2.5 weight-percent of halogenated or-

ganic material that (a) is halogenated with either chlorine or bromine atoms that together constitute at least 40 weight-percent of the organic material, (b) exhibits no more than about 1 weight-percent loss when heated to 200° C in a thermogravimetric analysis performed by raising the temperature of the organic material from room temperature at a rate of 40° C/minute, (c) exhibits no more than about 3 weight-percent halogen loss after two weeks at 175° C, (d) exhibits less than 10 percent loss in overall weight after two weeks at 175° C and (e) comprises less than about 50 weight-percent of said adhesive composition.

12. A flame-retardant electrically insulating pressure-sensitive adhesive tape which is compatible, as defined herein, with magnet wire insulation and exhibits at least 20 ounces of adhesion to steel per inch width, comprising a flexible backing and at least one layer of pressure-sensitive adhesive composition united to the backing, said adhesive composition comprising (1) a base pressure-sensitive adhesive material that exhibits less than about 3 weight-percent halogen loss after two weeks at 175° C, (2) at least 2.5 weight-percent of halogenated polynuclear aromatic ether that (a) is halogenated with either chlorine or bromine atoms that together constitute at least 40 weight-percent of said ether, (b) exhibits less than 1 weight-percent loss when heated to 200° C in a thermogravimetric analysis performed by raising the temperature of said ether from room temperature at a rate of 40° C/minute, (c) exhibits less than about 3 weight-percent halogen loss after two weeks at 175° C, (b) exhibits less than 10 percent loss in overall weight after two weeks at 175° C, and (e) comprises less than about 50 weight-percent of said adhesive composition, and (3) antimony trioxide.

15. A flame-retardant electrically insulating pressure-sensitive adhesive tape which is compatible, as defined herein, with magnet wire insulation and exhibits at least 20 ounces of adhesion to steel per inch of width comprising a flexible backing and at least one layer of pressure-sensitive adhesive composition united to the backing, said adhesive composition comprising an acrylate-based pressure-sensitive adhesive and 10 to 50 weight-percent of decabromodiphenyl oxide.

4,061,827

FIBRES

Jack Gould, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 1, 1976, Ser. No. 662,684
Claims priority, application United Kingdom, Mar. 3, 1975, 8728/75
Int. Cl.² B32B 5/16; H05B 3/10, 3/18
U.S. Cl. 428—368 10 Claims

1. An improved electrically conductive fibre, formed from a thermoplastic organic polymer, in which the electrical conductivity is due to electrically conductive carbon particles penetrating an outer region of the fibre, wherein the improvement comprises the fibre having a zero or positive temperature coefficient of resistance.

7. The improved conductive fibre of claim 1, wherein said polymer is a polyester, polyamide, polyacrylonitrile or modified polyacrylonitrile.

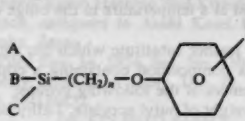
4,061,828

MODIFIED, GRAFTED MINERAL CARRIERS

Honore Mazarguil, Ramonville Saint Agne; Francois Meiller, Palaiseau, and Pierre Monsan, Toulouse, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Mar. 26, 1976, Ser. No. 670,899
Claims priority, application France, Apr. 4, 1975, 75.10597
Int. Cl.² B32B 19/02; B05D 7/00, 7/24
U.S. Cl. 428—403 7 Claims

1. A method of preparing carriers comprising grafting onto a mineral carrier, a silicon derivative, diazotizing the grafted mineral carrier, and then fixing adenine or its derivative onto the diazotized grafted mineral carrier in which the silicon derivative to be grafted is of the general formula



wherein A, B and C, which may be similar or different, are selected from the group consisting of methoxy, ethoxy, methyl or ethyl, provided that at least one of them is reactive with an Oh group in the mineral carrier, *n* being a whole number with a value from 2 to 4.

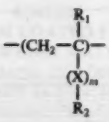
4,061,829

NEGATIVE RESIST FOR X-RAY AND ELECTRON BEAM LITHOGRAPHY AND METHOD OF USING SAME

Gary Newton Taylor, Fanwood, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 26, 1976, Ser. No. 680,156
Int. Cl.² B05D 3/06
U.S. Cl. 428—451 41 Claims

1. Article comprising a substrate coated with a radiation sensitive material, characterized in that said material consists essentially of a polymer prepared from a first monomer selected from the group consisting of monomers represented by the formula



where R_1 is selected from the group consisting of H and CH_3, X is

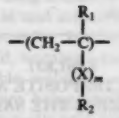
and *m* is 0 or 1, and R_2 is an alkyl group with the formula $C_nH_{2n-x+1}Y_x$ where *n* and *x* are equal to or greater than one, *x* is equal to or less than $2n + 1$, and Y is selected from the group consisting of chlorine and bromine, together with a second monomer said second monomer being a vinyl monomer, said first monomer forming between 50 percent and 100 percent by weight, of the polymer.

18. Process for pattern delineating a substrate coated with a negative resist material comprising the steps of

exposing selected portions of said resist material to radiation which causes said exposed portions to become less easily removable with respect to the unexposed portions, in which said resist consists essentially of a polymer;

removing the unexposed portions; and

processing the pattern delineated resist and substrate with processing steps that alter the bared substrate areas, characterized in that said polymer consists essentially of a polymer prepared from a first monomer selected from the group consisting of monomers represented by the formula



where R_1 is selected from the group consisting of H and CH_3, X is

and m is 0 or 1, and R_2 is an alkyl group with the formula $C_nH_{2n-x+1}Y_x$ where n and x are equal to or greater than one, x is equal to or less than $2n+1$, and Y is selected from the group consisting of chlorine and bromine, together with a second monomer, said second monomer being a vinyl monomer, said first monomer forming between 50 percent and 100 percent by weight of the polymer.

4,061,830
SELECTIVE SOLAR ENERGY RECEIVER AND METHOD FOR ITS PRODUCTION

Charles B. Greenberg, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 23, 1975, Ser. No. 643,724
Int. Cl.² F24J 3/02
U.S. Cl. 428—469 13 Claims

1. A method for producing a solar energy receiving surface comprising the steps of:

a. cleaning a surface of an aluminum substrate; and

b. contacting the surface of the substrate with an alkaline coating solution consisting essentially of:

a water soluble salt of a metal selected from the group consisting of nickel, zinc, silver, cadmium, copper cobalt, lead, tin, iron, and combinations thereof;

a complexing agent for the selected metal;

a sulfur compound capable of reacting with the selected metal to form a sulfide; and

water

to form a uniform metal sulfide coating.

4,061,831
THERMAL RECORDING SYSTEM

Kenneth J. Quast, Milford, N.H., assignor to Bard Laboratories, Inc., Amherst, N.H.

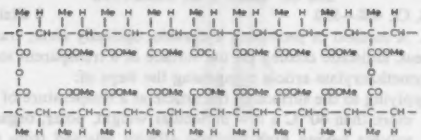
Filed Apr. 13, 1976, Ser. No. 676,425
Int. Cl.² B32B 27/36, 29/00
U.S. Cl. 428—480 20 Claims

17. In a method for recording on a thermally responsive sheet employing selective thermal activation of an amine-polyketo color compound system to produce a visible mark, the improvement comprising conducting, upon said thermal activation, a redox reaction between a cyclic polyketo compound in reversibly reduced form and an N-substituted thiuram polysulfide to reductively decompose said thiuram polysulfide and to oxidize said reduced polyketo compound to provide, respectively, cyclic polyketo compound and reactive amine components of an amine-cyclic polyketo color compound system responsive to said thermal activation.

4,061,832
POSITIVE-WORKING ELECTRON RESISTS

Edward D. Roberts, Purley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,486
Claims priority, application United Kingdom, Mar. 20, 1975, 11660/75
Int. Cl.² B05D 3/06
U.S. Cl. 428—500 4 Claims



1. A positive-working electron resist produced by forming then drying and heating, at a temperature of from 150°-250° C in a moist atmosphere containing from 0.5–20% by volume of water vapor, a coating of an inert solvent solution of a polymeric substance, said polymeric substance consisting essentially of the copolymer B-D wherein

B represents an unsaturated organic compound of the formula

and D represents an unsaturated carboxylic acid chloride of the formula

wherein any of R_1, R_2, R_4 and R_5, is a hydrogen atom, an aryl group or an alkyl group, R_3 represents an alkyl group, a saturated acyloxy group, an aryl group or a —COOR group in which R is an alkyl group, and wherein the co-polymer contains 0.5–30 mol.% of D.

4,061,833
LATEX COATINGS FOR ELECTROGRAPHIC SHEETS

Ronald R. Pelletier, Bay City; Robert D. Hansen, Midland, and James J. Vanderbush, Edenville, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 415,922, Nov. 14, 1973, abandoned. This application Jan. 6, 1976, Ser. No. 646,806
Int. Cl.² B05D 3/02; B32B 23/08, 27/10
U.S. Cl. 428—511 6 Claims

1. An electrostatic sheet suitable for electrographic printing comprising a substrate in the form of a flexible or rigid sheet having adhered to at least one surface thereof a continuous dielectric film consisting essentially of a copolymer of from about 0.5 percent to about 8 percent of methacrylic acid of maleic acid and the balance consisting essentially of (a) a styrene compound and (b) a conjugated diene hydrocarbon or an alkyl ester of acrylic acid or of methacrylic acid; said alkyl ester having from 1 to 18 carbon atoms in the alkyl.

4,061,834

DURABLE ANTISTATIC COATING FOR POLYMETHYLMETHACRYLATE

Vaclav Hadek; Robert B. Somoano, both of La Canada, and Alan Rembaum, Altadena, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 3, 1976, Ser. No. 692,284
Int. Cl.[2] B05D 5/06; C09K 3/16
U.S. Cl. 428—522 8 Claims

1. A method of providing a durable, optically clear, transparent, antistatic coating on the surface of a transparent solid polymethacrylate article comprising the steps of:

applying to the surface of the article at a temperature of no more than 40° C a low molecular weight, polar, organic solvent having high electron affinity selected from the group consisting of nitromethane or acetonitrile, to form an antistatic coating comprising a surface layer of said article having at least 0.05% by weight of said solvent retained therein; and

drying said surface.

4,061,835

PROCESS OF FORMING A POLYPROPYLENE COATED SUBSTRATE FROM AN AQUEOUS SUSPENSION OF POLYPROPYLENE PARTICLES

Wassily Poppe, Lombard, and Ivor R. Fielding, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 553,891, Feb. 27, 1975. This application June 25, 1976, Ser. No. 699,697
Int. Cl. B32B 27/30, 27/32
U.S. Cl. 428—522 13 Claims

1. The method of forming a coated substrate, which comprises depositing an aqueous coating composition comprising a dispersion of a resinous polymer of an alpha, beta-ethylenically unsaturated carboxylic acid compound and suspended particles of a resinous polymer of propylene to a substrate and fusing the resinous polymer of propylene at a temperature of from about 190° to 250° C. until the resinous polymer of propylene coalesces, wherein said resinous addition polymer of an alpha, beta-ethylenically unsaturated carboxylic acid compound comprises at least one member selected from the group consisting of alpha, beta-ethylenically unsaturated carboxylic acid and alpha, beta-ethylenically unsaturated carboxylic ester, and is present in a concentration of from about 5 to 200 parts by weight per each 100 parts by weight resinous polymer of propylene, said resinous polymer of propylene contains at least 75% by weight propylene, said particles have a maximum average particle diameter size of 500 microns, and the polymeric components of said coating composition comprise from 10 to 75 parts by weight per each 100 parts by weight of the coating composition.

4,061,836

THERMOGRAPHIC RECORDING SYSTEM

Albert P. Yundt, Medfield, Mass., assignor to Bard Laboratories, Inc., Amherst, N.H.

Filed Apr. 13, 1976, Ser. No. 676,426
Int. Cl.[2] B32B 29/00; B05D 3/02
U.S. Cl. 428—537 13 Claims

9. In a method for recording on a thermally responsive sheet employing selective thermal activation of an amine-polyketo color compound system to produce a visible mark, the improvement comprising conducting, upon said thermal activation, a redox reaction between a cyclic polyketo compound in reversibly reduced form and an N,N′ polythiodiamine to reductively decompose said N,N′ polythiodiamine and to oxidize said reduced polyketo compound to provide, respectively, cyclic polyketo compound and reactive amine components of an amine-cyclic polyketo color compound system responsive to said thermal activation.

4,061,837

PLASTIC-METAL COMPOSITE AND METHOD OF MAKING THE SAME

Irving J. Hutkin, 5284 Stonecourt, San Diego, Calif. 92115

Filed June 17, 1976, Ser. No. 697,204
Int. Cl.[2] B32B 15/08, 15/20
U.S. Cl. 428—609 8 Claims

1. An improved plastic-metal unitary circuit composite having reduced staining and line lifting characteristics, said composite comprising, in combination:

a. copper foil, a side thereof having a rough irregular surface with improved bondability to plastic but substantial staining characteristics;

b. a layer about 5 to about 80 microinches thick of metal selected from the group consisting of cadmium, cadmium alloy of tin, cadmium alloy of zinc, cadmium alloy of copper, encapsulating said rough irregular surface without substantially depreciating said bondability; and,

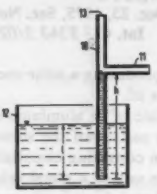
c. a plastic substrate bonded to said encapsulating layer.

4,061,838

APPARATUS FOR CONTROLLING THE ELECTROLYTE CONCENTRATION OF FUEL CELL BATTERIES

Philipp Jäger, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 12, 1976, Ser. No. 675,967
Claims priority, application Germany, Apr. 29, 1975, 2519098
Int. Cl.[2] H01M 8/08
U.S. Cl. 429—22 4 Claims



1. Apparatus for controlling the electrolyte level and electrolyte concentration of a fuel cell battery, comprising:

a. an electrolyte vessel in the electrolyte loop of the fuel cell battery; and

b. a tube, open on both sides, immersed in the electrolyte vessel with its upper end available for coupling to the reaction water depleted in the fuel cell battery, said tube having an overflow at a distance h from the lower end of said tube where h is selected such that $h = l \cdot \gamma_1/\gamma_o$ where l is the immersion depth of said tube in said electrolyte vessel, γ_1 is the density of the electrolytic liquid and γ_o is the density of the depleted reaction water, said overflow being above the level of the electrolyte in said electrolyte vessel.

4,061,839

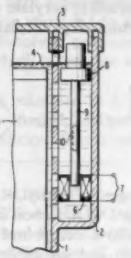
WARNING DEVICE FOR INDICATING CRITICAL CONDITION OF STARTER BATTERIES IN VEHICLES

Werner Köhler, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 6, 1972, Ser. No. 295,489
Claims priority, application Germany, Oct. 9, 1971, 2150477
Int. Cl.[2] H01M 10/48
U.S. Cl. 429—93 25 Claims

1. A warning installation for indicating a critical charge condition of starter batteries in vehicles, especially in motor vehicles, according to the areometer principle, characterized

by an areometer housing means connected with the interior space of a battery housing means by way of aperture means, float means movable in said areometer housing means, a coil disposed in said areometer housing means and protected against the battery acid, warning means connected to said coil, a core of magnetizable material connected with said float means, said float means being arranged for sinking in said areometer housing when the acid concentration falls below a predetermined level so that said core is immersed within said coil, said coil being responsive to the immersing of said core therein for changing the inductance thereof and triggering said warning means to provide at least one of an acoustic and optical warning signal indicating that the acid concentration of the battery is below the predetermined level, the coil forming part of a tuned circuit of an oscillator means connected thereto, said tuned circuit being tuned to resonance upon immersion of the core into the coil, thereby causing the oscillator means to generate a signal with a frequency corresponding to the resonance of the tuned circuit, the signal being amplified in an amplifier connected in the output of the oscillator means and the amplified signal triggering a warning signal in an indicating means connected to the amplifier, a delay means being connected in front of the indicating means which prevents the triggering of a warning signal as a result of a sinking of the float means caused by vibrations.



4,061,840

SODIUM SULPHUR CELLS

Ivor Wynn Jones; Graham Robinson, and Thomas Lewis Bird, all of Chester, England, assignors to The Electricity Council, London, England

Continuation-in-part of Ser. No. 550,072, Feb. 14, 1975, Pat. No. 3,982,957. This application Sept. 9, 1976, Ser. No. 721,907

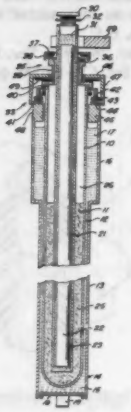
Claims priority, application United Kingdom, Feb. 15, 1974, 4884/74

The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.

Int. Cl.² H01M *10/39*

U.S. Cl. 429—104 **7 Claims**

1. In a sodium sulphur cell having a current collector in contact with the cathodic reactant, the improvement wherein said current collector is formed of an impermeable carbon or graphite tube, a conductive solid metal core within the carbon or graphite tube, and graphite felt around said core constituting a deformable conductive interface between the surface of the core and the internal surface of the tube.



4,061,841

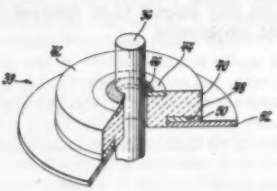
FEEDTHROUGH ASSEMBLY FOR LITHIUM-IRON SULFIDE CELL

Ram A. Sharma, Sterling Heights; Walter J. Wright, Utica, and Richard A. Murie, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1977, Ser. No. 787,875

Int. Cl.² H01M *6/36*

U.S. Cl. 429—112 **4 Claims**



1. In an electrochemical cell comprising electrodes encased within a housing, there being a metallic rod comprised of molybdenum extending through the housing, said rod being in electrical connection with one electrode of the cell and serving as one terminal of the cell, a sealing and insulating construction for insulating the metallic rod from and bonding the rod to the outer housing comprising

an electrically insulating body comprising a material selected from the group consisting of aluminum nitride, yittria, or mixtures thereof surrounding said rod and insulating it from said housing,

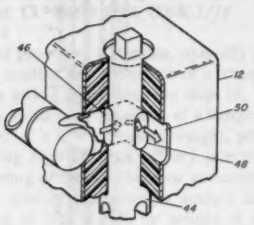
a first molybdenum body which is integrally bonded to the insulating body and surrounding the rod and which is welded to said rod, and

a second molybdenum body which is integrally bonded to the insulating body and surrounding the rod but spaced apart and electrically insulated from both the rod and the first molybdenum body, and is bonded to the housing, said construction, the terminal rod and the outer housing, together with the bonds between them cooperating to produce a hermetic seal.

4,061,842
FAIL SAFE BATTERY

David G. Evans, Hackettstown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 26, 1976, Ser. No. 744,901
Int. Cl.[2] H01M 6/38
U.S. Cl. 429—116 1 Claim



1. A delay action battery comprising:
a casing;
a plurality of cell plates mounted in said casing;
a reservoir for electrolyte mounted externally to said casing;
a conduit communicating with said reservoir and said casing containing said cell plates;
a rupturable partition means for retaining said electrolyte in said reservoir isolated from said cell plates; and
means for pressurizing said electrolyte to rupture said partition means and cause said electrolyte to enter said casing and activate said cell plates,
wherein said reservoir being a tubular container having said rupturable partition means positioned at one end, a closure means at the other end and an explosive charge for rupturing said closure means and pressurizing said electrolyte, and
wherein said tubular container is provided with at least one blow out plug adapted to be removed on exposure at elevated temperatures.

4,061,843
BATTERY PLATES

Stanley Charles Foulkes, Bolton, England, assignor to Chloride Group Limited, London, England

Continuation-in-part of Ser. No. 623,897, Oct. 20, 1975. This application Dec. 23, 1975, Ser. No. 643,908
Claims priority, application United Kingdom, Dec. 23, 1974, 55500/74; Oct. 15, 1975, 42226/75
Int. Cl.[2] H01M 2/18
U.S. Cl. 429—136 3 Claims

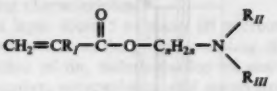
1. A lead acid tubular battery plate comprising a porous envelope enclosing a lead or lead alloy current collector comprising an array of members extending perpendicularly from an end member which affords a current take off lug with lead oxide active material disposed between the perpendicular current collector members and the inside face of the porous envelope characterised in that the ratio of the length of the tubes in cms to the free cross sectional area in sq. cms is in the range 100:1 to 295:1 and the degree of stratification of the active material in the tubes is less than 5%.

4,061,844
DYESTUFF ACCEPTOR FOR SYNTHETIC RESINS

Iko Itoh; Yasuhiko Inoue, and Kenji Nagaoka, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Continuation of Ser. No. 427,714, Dec. 26, 1973, abandoned. This application May 6, 1975, Ser. No. 575,043
Claims priority, application Japan, Dec. 28, 1972, 47-1392
Int. Cl.[2] C08K 5/56, 5/57
U.S. Cl. 526—4 17 Claims

1. A dyestuff acceptor of synthetic resins, comprising as essential components (A) a copolymer comprising about 20 to 99 mole % of at least one ethylenically unsaturated monomer which is not an aminoalkyl acrylate compound and about 1 to 80 mole % of an aminoalkyl acrylate compound represented by the formula,



wherein R_I is hydrogen or methyl, R_{II} and R_{III} each are hydrogen or alkyl having 1 to 4 carbon atoms, and n is an integer from 1 to 4, and (B) a compound of a polyvalent element selected from silicon and tin, having at least one functional group selected from the group consisting of carboxyl, thioalkoxy, alkyl, phenyl and cyclopentadienyl, the weight ratio of said component (A) to said component (B) being about 100:1 to 1:1.

4,061,845
COPOLYMERS OF HYDRAZIDES AND CERTAIN UNSATURATED ESTERS

Hubert J. Fabris, Akron; David P. Gruber, Cuyahoga Falls; David R. Sponseller, Akron, and Heinz Uelzmann, Tallmadge, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Nov. 4, 1976, Ser. No. 738,775
Int. Cl.[2] C08G 67/00, 69/00, 18/10
U.S. Cl. 526—11.1 10 Claims

1. A reactive composition useful in forming polymeric coatings and adhesives and comprising a copolymer of:
a. a hydrazide having the formula $R(C(O)—NH—NHR')_a$ where a is a number from 1 to 10, each (O) is a carbonyl oxygen atoms, R is selected from the group consisting of —R', —OR', —NR'_2, —NHNHR', —C(O)NHNHR' and polyvalent organic radicals having molecular weights of from 14 to 15,000, and each R' is a hydrogen atom or a monovalent organic radical having a molecular weight of from 14 to 450 and being free of functions which react with methyl acrylate at 80° C., and
b. an unsaturated organic ester having from 1 to 5 aliphatic double bonds activated by a carbonyl group, the average number of said carbonyl-activated double bonds being greater than one, and having a molecular weight of from about 71 to 12,000.

4,061,846
FLEXIBLE WATER SWELLABLE CROSSLINKED POLYACRYLATE FILM

James R. Gross, Lake Jackson, and Russell T. McFadden, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 450,650, March 13, 1974, Pat. No. 3,926,891. This application June 30, 1975, Ser. No. 591,741
Int. Cl.[2] C08L 31/02, 33/02; B29D 7/02
U.S. Cl. 526—16 1 Claim

1. A flexible water swellable crosslinked polyacrylate film produced by the method which comprises
A. applying a coating on an impervious substrate wherein the coating comprises a crosslinkable aqueous solution

which is prepared by forming a polyacrylate solution having about 30 to about 70 weight percent alkali metal carboxylates by dissolving in an aqueous alkali metal hydroxide solution a polyacrylate comprising

1. about 30 to about 92 percent by weight of an alkyl acrylate wherein the alkyl group has 1–10 carbon atoms, an alkyl methacrylate wherein the alkyl group has 4–10 carbon atoms, or mixtures thereof,
2. about 8 to about 50 percent by weight of an olefinically unsaturated carboxylic acid, and
3. about 0 to about 15 percent by weight of an omega hydroxy-alkyl acrylate having 1–4 carbon atoms in the hydroxy alkyl group,

heating the solution until saponification is complete, and adding to said solution about 0.1 to about 10 weight percent, based on the dissolved polymer of a water soluble crosslinking agent which is reactive with carboxylate salt groups

B. heating said coated substrate to a temperature greater than about 30° C to crosslink said polyacrylate, and

C. separating said crosslinked film from said substrate.

4,061,847

ETHYLENE POLYMER ACIDIFICATION PROCESS

Richard H. Hughes, Overland Park; Donald R. Jamieson, Merriam, both of Kans., and Rajindar K. Kochhar, Katy, Tex., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation of Ser. No. 48,436, June 22, 1970, abandoned. This application Apr. 12, 1973, Ser. No. 350,557

Int. Cl.² C08F *8/30, 8/44*

U.S. Cl. 526—49 **2 Claims**

1. A method for chemically modifying at least the surface of a film of an ethylene copolymer containing pendant metallic carboxylate salt groups without changing the physical form of said film which consists essentially of, in combination,

1. immersing a film of an ethylene copolymer containing pendant metallic carboxylate salt groups into an aqueous ammonium hydroxide solution containing 0.5 to 28 weight % ammonia,
2. maintaining said film in said aqueous ammonium hydroxide solution at ambient temperature for a period of 1 to 30 minutes,
3. removing said film from said aqueous ammonium hydroxide solution,
4. drying the film from (3), and
5. recovering a film in which a substantial proportion of the pendant metallic carboxylate salt groups of the ethylene copolymer has been converted to the corresponding carboxylic acid groups;

said ethylene copolymer consisting of at least 67 mol % of polymerized ethylene and containing from 0.01 to 0.5 mol of pendant metallic carboxylate salt groups, per mol of ethylene, the metallic cation of the carboxylate salt groups being selected from the group consisting of metallic cations which are soluble in water or which form a water-soluble complex with ammonia.

4,061,848

PROCESS FOR COOLING A POLYMERIZATION REACTOR

Eberhard Sistig, Marl, and Karl-Heinz Reinermann, Dulmen, both of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Germany

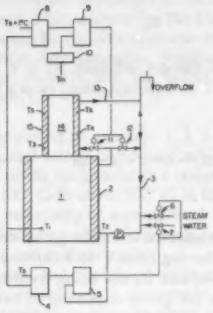
Filed Feb. 5, 1976, Ser. No. 655,449

Claims priority, application Germany, Feb. 5, 1975, 2504659

Int. Cl.² C08F *2/04, 2/18, 2/22, 2/12*

U.S. Cl. 526—61 **11 Claims**

1. In a process for cooling a polymerization reaction of compounds in a dispersion and/or solution with a polymerization reactor equipped with a reflux condenser, wherein the cooling is executed by evaporation of one or more liquids contained in the dispersion and/or solution, by condensation of vapors in the reflux condenser, and by recycling of the thus-condensed vapors into the reactor, and by cooling of the reactor with a controllable flow of coolant the improvement wherein a portion of said coolant is passed through said reflux



condenser and the amount of heat given off during condensation in said reflux condenser provides the control variable for a controller for controlling the amount of coolant fed into the reflux condenser.

4,061,849

PROCESS FOR THE RECOVERY OF GASEOUS OR VAPOROUS MONOMERS FROM REACTION OFF-GASES

Alfred Muenster, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 25, 1976, Ser. No. 670,249

Claims priority, application Germany, Mar. 29, 1975, 2514126

Int. Cl.² C08F *2/18, 6/00*

U.S. Cl. 526—68 **10 Claims**

1. A polymerization process in which a low-boiling olefinically unsaturated monomer having a boiling point at atmospheric pressure between −20° and 40° C is homopolymerized in a liquid material having a boiling point above 50° C at atmospheric pressure, and in which a reaction off-gas is generated containing from 10 to 50 percent by volume of the low-boiling olefinically unsaturated monomer, wherein the reaction off-gas is treated with a liquid material which boils above 50° C at atmospheric pressure and is selected from the group consisting of a solution of the low-boiling monomer in an inert organic solvent, an aqueous emulsion of the low-boiling monomer and an aqueous suspension of the low-boiling monomer, under conditions such that said material does not react with the low-boiling monomer, whereby low-boiling monomer is extracted from the reaction off-gas, and the resulting liquid material containing low-boiling monomer is employed in the polymerization process for manufacture of further amounts of polymer.

4,061,850

EMULSION POLYMERIZATION OF CHLOROPRENE IN THE PRESENCE OF A POLYSULFIDE MODIFIER

Morris S. Edmondson, Alvin, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

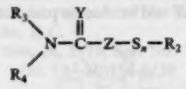
Division of Ser. No. 541,237, Jan. 15, 1975, Pat. No. 3,923,763, which is a continuation-in-part of Ser. No. 289,521, Sept. 15, 1972, abandoned. This application Aug. 18, 1975, Ser. No. 605,309

Int. Cl.² C08F *2/00, 34/00, 36/18, 236/18*

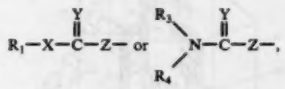
U.S. Cl. 526—220 **4 Claims**

1. A process for the emulsion polymerization of chloroprene which comprises polymerizing polymerizable monomer, consisting essentially of chloroprene and less than 15 mol percent of a comonomer, in the presence of from about 0.05 to 5 parts

by weight per 100 parts of polymerizable monomer of a modifier having the formula



and mixtures thereof wherein R_2 is a hydrocarbon radical having from 1 to 8 carbon atoms or is a radical the same as



R_3 and R_4 are selected from the group consisting of hydrocarbon radicals having from 1 to 8 carbons or hydrogen with at least one of R_3 and R_4 not being hydrogen, X, Y and Z are selected from the group consisting of oxygen and sulfur, R_1 is a hydrocarbon radical having from 1 to 8 carbon atoms, and n is 1 to 4.

4,061,851

7-AMINO-7-ARYLTHIO CEPHALOSPORINS

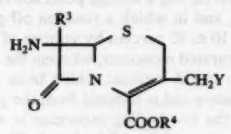
Joseph Edward Dolfini, and Ekkehard Bohme, both of Cincinnati, Ohio, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 651,742, Jan. 23, 1976, Pat. No. 4,026,886, which is a division of Ser. No. 480,789, June 19, 1974, Pat. No. 3,954,744, which is a division of Ser. No. 260,620, June 7, 1972, Pat. No. 3,840,533, and a continuation-in-part of Ser. No. 174,510, Aug. 24, 1971, abandoned. This application Jan. 17, 1977, Ser. No. 760,215

Int. Cl.[2] C07D *501/18;* A61K *31/545*

U.S. Cl. 544—21 **7 Claims**

1. A compound of the formula:



wherein R^3 is selected from the group consisting of phenylthio and substituted phenylthio wherein said substituent is selected from the group consisting of halogen, hydroxy, amino, nitro, and lower alkyl; R^4 is selected from the group consisting of hydrogen, lower alkyl, trichloroethyl, benzyl, methoxybenzyl, and benzhydryl; and Y is selected from the group consisting of hydrogen, acetoxy, pyridinium, and hydroxy; and pharmaceutically acceptable salts thereof.

4,061,852

7-METHOXY FURYLUREIDOCEPHALOSPORINS

Joseph Edward Dolfini, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

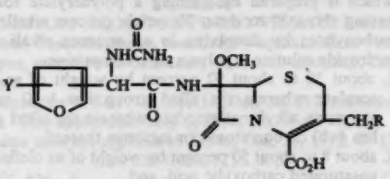
Continuation of Ser. No. 390,839, Aug. 23, 1973, abandoned. This application Feb. 6, 1976, Ser. No. 655,652

The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.

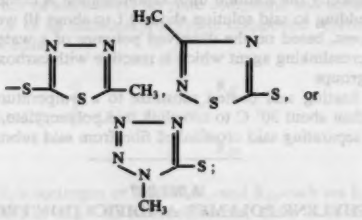
Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—27 **11 Claims**

1. A compound of the formula



wherein the 7-methoxy group occupies the α-configuration; R is



Y is H, Cl, Br, I, nitro, phenyl or methylsulfonyl; and pharmaceutically acceptable salts thereof, alkyl esters of 1 to 3 carbon atoms thereof, t-butyl ester, benzhydryl ester, haloalkyl esters of 1 to 3 carbon atoms thereof, or acyloxymethyl esters thereof wherein the acyl radical is alkanoyl of from 1 to 5 carbon atoms, benzoyl or phenacetyl.

4,061,853

VIRTUALLY SOLVENT-FREE CRYSTAL FORM OF THE SODIUM SALT OF CEPHACETRIL

Jakob Urech, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,376

Claims priority, application Switzerland, Dec. 9, 1975, 15974/75

Int. Cl.[2] C07D *501/26*

U.S. Cl. 544—30 **9 Claims**

9. A virtually solvent-free crystal form of the sodium salt of Cephacetril, which, using a Cu:K_α radiation source, has the following X-ray diffraction spectrum:

Interplanar spacings d in A	Relative line intensities I
15.2	m
10.7	m
7.86	m
7.60	w
7.03	m
5.04	m-st
4.94	w
4.65	st
4.39	st
4.10	vst
4.01	m
3.66	m
3.59	vw
3.50	st
3.36	vw
3.30	m
3.18	m
3.11	vw
3.04	w
3.02	w
2.96	w
2.88	w

the relative line intensities indicated having the following meanings: *vst* = very strong, *st* = strong, *m* = medium, *w* = weak and *vw* = very weak.

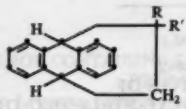
4,061,854

DIHYDROETHANOANTHRACENE DERIVATIVES USEFUL AS ANTIDEPRESSANTS

Masayuki Narisada, Ibaraki, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

Filed June 4, 1976, Ser. No. 692,941
Claims priority, application Japan, June 12, 1975, 50-71645; June 12, 1975, 50-71646
Int. Cl.² C07D 265/08
U.S. Cl. 544—88 9 Claims

1. A member selected from the group consisting of
1. a compound of the formula



wherein
R represents hydrogen or C_1–C_4 alkyl, and
R′ represents

wherein
A represents a member of the group consisting of C_2–C_4 alkylene and C_2–C_4 alkylene substituted by one or two C_1–C_4 alkyl moieties or by phenyl, and
2. a pharmaceutically acceptable acid addition salt thereof.

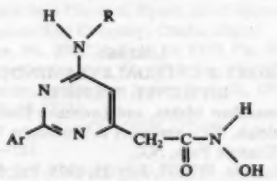
4,061,855

PYRIMIDIN-6-YL ACETHYDROXAMIC ACIDS

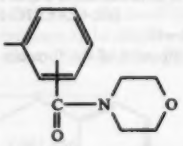
Claude P. Fauran, Paris; Jeannine A. Eberle, Chatou; Guy R. Bourgery, Colombes; Guy R. Raynaud, Paris, and Claude J. Gouret, Meudon, all of France, assignors to Delalande S.A., Courbevoie, France

Division of Ser. No. 554,532, March 3, 1975, Pat. No. 4,013,768. This application Dec. 10, 1976, Ser. No. 749,221
Claims priority, application France, Mar. 19, 1974, 74.09235
Int. Cl.² C07D 413/12; A61K 31/535
U.S. Cl. 544—122 6 Claims

1. A compound having the formula



wherein R is



and Ar is phenyl substituted by one chloro, one fluoro, one trifluoromethyl, one methylenedioxy or one or more methoxy.

6. A composition for treating a condition of circulatory insufficiency, gastro-duodenal ulcers, respiratory insufficiency, hypertension, edema, depression, pain, inflammation or cerebral deficit, comprising an effective amount of a compound as claimed in claim 1 for treating the condition, together with a therapeutically acceptable carrier.

4,061,856

TRIMERIZATION OF AROMATIC NITRILES

Li-Chen Hsu, Cleveland, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 10, 1974, Ser. No. 513,613
Int. Cl.² C07D 251/24
U.S. Cl. 544—193 13 Claims

1. A process for preparing an aromatic 1, 3, 5-triazine compound from an aromatic nitrile compound which comprises heating the aromatic nitrile compound to a temperature in the range of from about 100° C. to about 700° C. in the presence of a catalyst consisting essentially of a compound or mixture of compounds from at least one of the following groups:
A. organic sulfonic and sulfinic acids,
B. organic phosphonic and phosphinic acids, and
C. metallic acetylacetonates, at a pressure in the range of from about atmospheric pressure to about 10,000 p.s.i.

4,061,857

PROCESS FOR PREPARING POLYOLEFINS

Nobuyuki Kuroda, Yokohama; Takeichi Shiraishi, Kawasaki; Akio Itoh, Yokosuka; Kazuo Matsuura, Kawasaki, and Mituji Miyoshi, Kanagawa, all of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

Filed May 6, 1976, Ser. No. 683,965
Claims priority, application Japan, May 15, 1975, 50-56747
Int. Cl.² C08F 4/02, 10/02
U.S. Cl. 526—114 10 Claims

1. A process for preparing polyolefins which comprises polymerizing or copolymerizing olefins using as catalyst a solid carrier component containing a titanium compound and/or a vanadium compound, and an organoaluminum compound and/or an organozinc compound, said solid component being obtained by copulverizing (1) a magnesium dihalide and/or a mangenese dihalide, (2) an aluminum oxyhalide and (3) a titanium compound and/or a vanadium compound.

4,061,858

PURIFYING ACRYLONITRILE FOR THE MANUFACTURE OF ACRYLONITRILE POLYMERS

Hans Wild, Frankenthal; Rudolf Jung, Worms; Adolf Echte, Ludwigshafen; Johann Zizlsperger, Schriesheim, and Hermann Gausepohl, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed July 9, 1976, Ser. No. 703,955
Claims priority, application Germany, Aug. 1, 1975, 2534399
Int. Cl.² C08F 6/00, 20/44; C07C 121/30
U.S. Cl. 526—67 16 Claims

1. A process for the purification of monomeric acrylonitrile or an acrylonitrile-containing monomer mixture to be used in the manufacture of an acrylonitrile polymer, which process comprises treating said monomeric acrylonitrile or a mixture of acrylonitrile and another copolymerizable monomer with an alkaline-reacting compound, and then distilling under a pressure of from 20 to 150 mm of Hg and at a temperature of from 15 to 90° C.

4,061,859

VISCOSITY REDUCTION OF CELLULOSE DERIVATIVES

Wen-Jiu Cheng, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 14, 1976, Ser. No. 695,876
Int. Cl.² C08B 3/22, 3/24, 11/20
U.S. Cl. 536—88 10 Claims

1. In the process wherein a cellulosic ether or ester is contacted as an essentially dry powder with hydrogen halide at

about ambient to 80° C and is thereby converted to a corresponding ether or ester of substantially lower molecular weight, the improvement wherein the lower molecular weight product is contacted as an essentially dry powder with SO_2 gas at about ambient temperature, thereby inhibiting yellowing of said product.

4,061,860

STILBENE COMPOUNDS

Géza Kormány, Allschwil; Guglielmo Kabas, Aesch; Hans Schläpfer, and Adolf Emil Siegrist, both of Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

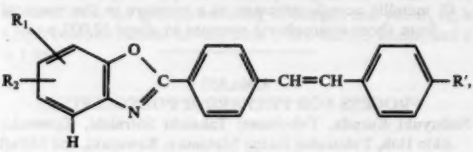
Filed Aug. 6, 1975, Ser. No. 601,881

Claims priority, application Switzerland, Aug. 14, 1974, 11108/74

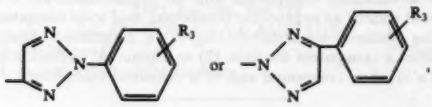
Int. Cl.² C07D *413/10*

U.S. Cl. 542—462 **18 Claims**

1. Stilbene compounds of the formula



wherein R_1 denotes hydrogen, chlorine, alkyl with 1 to 8 carbon atoms, alkoxy with 1 to 4 carbon atoms, alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy rest, cyanoalkyl, alkylsulphonyl, phenylalkyl with 1 to 3 carbon atoms in the alkyl part, sulfamoyl, cyclohexyl, phenyl, phenylsulphonyl or benzyl, R_2 denotes hydrogen or alkyl with 1 to 4 carbon atoms and R′ denotes a radical



wherein R_3 represents hydrogen, chlorine, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, carbalkoxy with 2 to 5 carbon atoms, unsubstituted sulphamoyl or sulphamoyl which is monosubstituted or disubstituted by alkyl or hydroxyalkyl with 1 to 4 carbon atoms or represents alkylsulphonyl with 1 to 4 carbon atoms.

4,061,861

7-[α-(2,3-DIHYDRO-2-OXO-1H-BENZIMIDAZOL-1-YLCARBONYL-AMINO)ARYLACETAMIDO]CEPHALOSPORINS

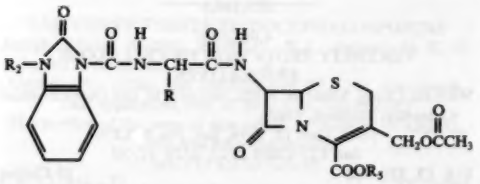
William H. W. Lunn, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 21, 1976, Ser. No. 698,431

Int. Cl.² C07D *501/34*

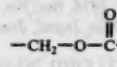
U.S. Cl. 544—30 **9 Claims**

1. A compound of the formula



in which R is phenyl, monohydroxyphenyl, dihydroxyphenyl, monohalophenyl, monohydroxy substituted monohalophenyl, thienyl, or furyl;

R_2 is hydrogen or methyl; and R_5 is hydrogen, indanyl, phthalidyl, an acyloxymethyl group of the formula



in which Y is C_1–C_4 alkyl or phenyl, or, when R_5 is hydrogen, the pharmaceutically acceptable non-toxic salts thereof.

4,061,862

DERIVATIVES OF 7-(CYCLIZED)PHENYLGLYCYL-3-TRIAZOLO-THIO BISMETHYL CEPHALOSPORIN

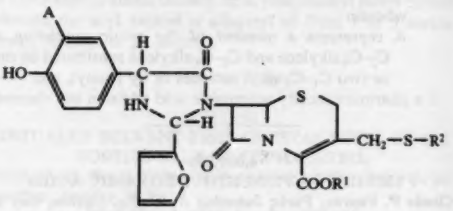
Murray A. Kaplan, Syracuse; William J. Gottstein, Fayetteville, and Alphonse P. Granatek, Baldwinsville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 620,005, Oct. 6, 1975, abandoned. This application Feb. 2, 1976, Ser. No. 654,314

Int. Cl.² C07D *501/36*

U.S. Cl. 544—27 **16 Claims**

1. A compound of the formula



wherein

A is hydrogen, hydroxy, methyl or methoxy,

R^1 is hydrogen, sodium or potassium, and

R^2 is 1,2,3-triazol-5-yl, such group being unsubstituted or substituted with one or two lower alkyl groups of one to four carbon atoms.

4,061,863

2-CARBALKOXY-2′-CYCLOALKYLAMINOCARBONYL-DIPHENYL SULFIDES

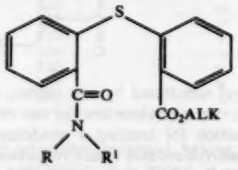
Nariman Bomanshaw Mehta, and Lawrence Edward Brieaddy, both of Raleigh, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 597,697, July 21, 1975, Pat. No. 3,997,540. This application Sept. 24, 1976, Ser. No. 726,453

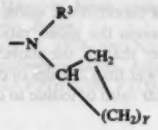
Int. Cl.² C07C *149/41*

U.S. Cl. 560—18 **5 Claims**

1. The compound of the formula



where NRR¹ is



where Y is 3 or 4 and R^3 is hydrogen or lower alkyl of 1 to 4 carbon atoms and ALK is alkyl of 1 to 4 carbon atoms.

4,061,864

THIOL CONTAINING COMPOUNDS AND THEIR PREPARATION

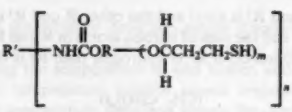
James Leverette Guthrie, Ashton, and Shrikant Vishwanath Dighe, Bethesda, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 408,338, Oct. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 393,862, Sept. 4, 1973, Pat. No. 3,883,598. This application Jan. 26, 1976, Ser. No. 652,239

Int. Cl.² C07C *101/447*

U.S. Cl. 560—26 **2 Claims**

1. An ether thiol of the formula:



wherein R′ is the polyvalent organic moiety consisting of the residue of a commercially available polyisocyanate after reaction of the NCO groups, R is the backbone of a saturated aliphatic polyol consisting of atoms of carbon, hydrogen and oxygen and free to reactive functional groups, said polyol containing up to 60 carbon atoms, *m* is an integer of 1 to 7 and *n* is at least 2.

4,061,865

PROSTAGLANDIN ANALOGUES

Masaki Hayashi; Tadao Tanouchi, both of Takatsuki; Hiroyuki Ito, Suita, and Isao Ohyama, Kyoto, all of Japan, assignors to Ono Pharmaceutical Company, Osaka, Japan

Division of Ser. No. 398,714, Sept. 19, 1973, Pat. No. 3,962,312. This application Aug. 11, 1975, Ser. No. 603,475

Claims priority, application Japan, Sept. 21, 1972, 47-94972; Mar. 23, 1973, 48-33234

Int. Cl.² C07C *177/00*

U.S. Cl. 560—121 **8 Claims**

1. 16(R)-Methyl-13,14-dihydro-PGE_2.
5. 16(ε)-Phenyl-ω-trinor-13,14-dihydro-PGE_2.
6. 16(ε)-Cyclohexyl-ω-trinor-13,14-dihydro-PGE_2.
7. 16(ε)-Cyclopentyl-ω-tetranor-13,14-dihydro-PGE_2.
8. 16(ε)-Cyclopentyl-ω-trinor-13,14-dihydro-PGE_2.

4,061,866

2,2-DIFLUORO-13,14-DIHYDRO-PGF_1 ANALOGS

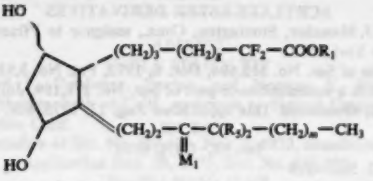
Udo F. Axen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 17, 1976, Ser. No. 724,157

Int. Cl.² G07C *177/00*

U.S. Cl. 560—121 **18 Claims**

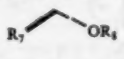
1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof,

wherein *g* is 2 to 4, inclusive;

wherein M_1 is

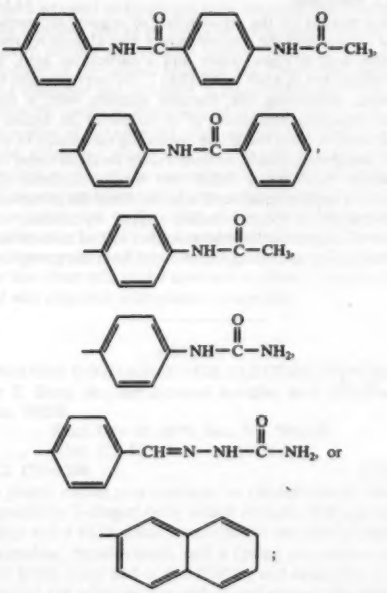


or

wherein R_7 and R_8 are hydrogen or methyl, with the proviso that one of R_7 or R_8 is methyl only when the other is hydrogen;

wherein *m* is 2 to 4, inclusive;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro, alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation,



wherein R_5 is hydrogen, methyl, or fluoro with the proviso that R_5 is fluoro only when R_7 and R_8 are both hydrogen, with the proviso that R_5 is methyl only when R_7 and R_8 are both hydrogen, and with the proviso that R_5 is hydrogen only when either one of R_7 and R_8 is methyl.

4,061,867

ACRYLATE ESTER DERIVATIVES

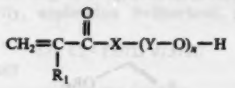
James J. Hamsher, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 312,694, Dec. 6, 1972, Pat. No. 3,925,157, which is a continuation-in-part of Ser. No. 271,159, July 12, 1972, abandoned. This application Aug. 13, 1975, Ser. No. 715,745

Int. Cl.[2] C07C 9/54

U.S. Cl. 560—219 1 Claim

1. The product produced by contacting a hydroxy-containing vinyl monomer with a cyanogen halide, said monomer having the formula



wherein

X is —O—;

Y is ethylene or propylene;

n is 1 or 2; and

R_1 is selected from the group consisting of hydrogen, methyl and chloro.

4,061,868

PROCESS FOR THE MANUFACTURE OF GLYCOLS AND GLYCOL NONO-ESTERS

Carlo Fumagalli, Sirone (Como); Giuseppe Caprara, Milan, and Paolo Roffia, Mantova, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Sept. 25, 1975, Ser. No. 616,602

Claims priority, application Italy, Nov. 14, 1974, 29433/74; July 11, 1975, 25335/75

Int. Cl.[2] C07C 67/05, 29/04

U.S. Cl. 560—246 12 Claims

1. In a process for the manufacture of organic monoesters of vicinal glycols and the corresponding free glycols by reacting an olefin with oxygen, water and a carboxylic acid, in the liquid phase, and at a pH lower than 7, the improvement which comprises contacting the reaction mixture with a catalyst system consisting essentially of (i) iodine or an iodine compound selected from the group consisting essentially of copper iodide, manganese iodide, cerium iodide, an alkali metal iodide, an alkaline earth metal iodide and the iodohydrine of said olefin, (ii) a copper compound selected from the group consisting essentially of copper oxide, copper hydroxide, copper carbonate, copper iodide and a copper salt of said carboxylic acid, and (iii) an activating ion selected from the group consisting of manganese cation, cerium cation, an alkali metal cation, an alkaline earth metal cation, nitric anion, and mixtures of any of the foregoing, wherein the molar ratio of said carboxylic acid to water is lower than 1, the molar ratio of copper to water is equal to or lower than 2 moles of copper per 100 moles of water, and the molar ratio of iodine to copper is lower than 1.

4,061,869

ANTISTATIC AGENT FOR THERMOPLASTIC SYNTHETIC RESIN

Werner Schwarze, Frankfurt; Wolfgang Merk, and Volker Binder, both of Hanau, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt and Henkel U. Cie, Dusseldorf-Holthausen, both of, Germany

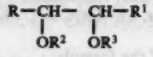
Filed May 18, 1976, Ser. No. 687,632

Claims priority, application Germany, May 20, 1975, 2522287

Int. Cl.[2] C08L 23/06, 23/12, 25/06, 27/06

U.S. Cl. 526—1 18 Claims

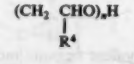
1. A composition comprising a compound of the formula



where

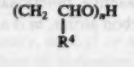
one of R and R^1 is alkyl and the other R and R^1 is hydrogen or alkyl and the sum of carbon atoms in R and R^1 is 4 to 30,

R^2 is hydrogen or, if R^3 is hydrogen then R^2 is the group



where *n* is 1 to 10,

R^3 is hydrogen or, if R^2 is hydrogen than R^3 is the group



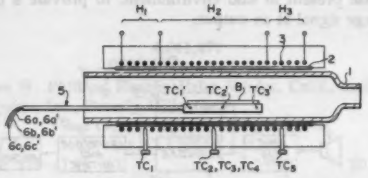
and

R^4 is hydrogen or methyl and a thermoplastic synthetic resin which is a polyolefin, polyvinyl chloride, polystyrene, polyvinyl acetate, polymethyl methacrylate, styrene-acrylonitrile copolymer or ethylene-vinyl acetate copolymer, said compound being present in an amount sufficient to impart antistatic properties to said resin.

4,061,870
TEMPERATURE CONTROL SYSTEM

Youichi Mizushina, Hamura, Japan, assignor to Kokusai Electric Co., Ltd., Tokyo, Japan

Filed July 28, 1975, Ser. No. 599,396
Claims priority, application Japan, July 31, 1974, 49-88212
Int. Cl.² F27B 5/00; F27D 19/00
U.S. Cl. 13—24 5 Claims



1. A system for establishing a uniform temperature distribution within a reactor tube of a furnace comprising:

a. a furnace having a reactor tube therein,

b. first temperature detection means disposed internally of said reactor tube,

c. heater means disposed externally of said furnace for heating said furnace,

d. first temperature control means responsive to said first temperature detection means for controlling said heater means,

e. second temperature detection means disposed externally of said reactor tube and in the vicinity of said heater for detecting the temperature of said heater, and

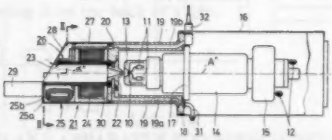
f. second temperature control means responsive to said second temperature detection means for controlling said heater means,

whereby said heater is controlled to establish a uniform temperature distribution within said reactor tube.

4,061,871
ELECTRON GUN FOR HEATING, MELTING AND VAPORIZING PURPOSES, WITH DEFLECTION SYSTEMS

Peter Sommerkamp, Hanau am Main, and Walter Heil, Neuberg, both of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Germany

Filed Apr. 29, 1976, Ser. No. 681,634
Claims priority, application Germany, May 2, 1975, 2519537
Int. Cl.² H01J 37/305
U.S. Cl. 13—31 8 Claims

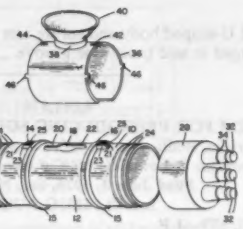


1. In an electron gun for heating, melting and vaporizing purposes having electron-emitting cathode means, at least one beam-forming electrode means associated with the cathode means, accelerating anode means, electromagnetic lens means and beam guiding-tube means extending in the direction of the beam path and surrounded by electromagnetic deflection systems for x-axis deflection and for y-axis deflection, envelope tube means disposed outside of the deflection systems and being joined at its extremity to the end of the beam guiding tube means by end plate means through which pole shoe means of the x-axis deflection system are brought, the improvement which comprises inclining the end plate means towards the cathode means beginning from the pole shoe means of the x-axis deflection system.

4,061,872
CABLE SPLICE KIT

Richard L. DeMonsy, Encino, and Norman K. Hankins, Northridge, both of Calif., assignors to Hexcel Corporation, Dublin, Calif.

Continuation of Ser. No. 412,388, Nov. 2, 1973, abandoned. This application Dec. 29, 1975, Ser. No. 644,407
Int. Cl.² H02G 15/18
U.S. Cl. 174—138 F 4 Claims



1. An enclosure kit for encapsulating and sealing a splice between two cables comprising:

an enclosed chamber adapted to receive the splice therein, said chamber having a cylindrical center section having an access hole for the pouring of plastic compound into said chamber, said access hole having oppositely directed longitudinal extensions partially axially offset and extending outwardly from a central portion of said access hole, said chamber further having means for providing apertures for passage of cables to the interior of said chamber; and

a sleeve adapted to be placed over the cylindrical section of the chamber and to be rotatable with respect thereto, said sleeve having an aperture corresponding to the central portion of the access hole and the cylindrical section of the chamber and a funnel portion extending outwardly from the aperture, and a pair of slots located on the opposite sides of the aperture with said slots overlapping each said extension when said aperture is aligned with the central portion of the access hole to thereby provide a pair of air escape holes, one or the other of said slots adapted to overlap one or the other of the extensions when said aperture is partially disaligned with the center portion of said access hole to provide a single air escape hole on one or the other side of the aperture to allow complete filling of said chamber with plastic compound.

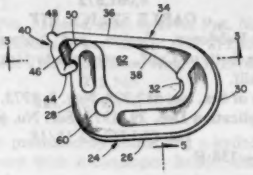
4,061,873
CORNER INSULATOR FOR ELECTRIC FENCES

Albert T. Berg, Jr., and Howard Langlie, both of Ellendale, Minn. 56026

Filed July 29, 1976, Ser. No. 709,860
Int. Cl.² H01B 17/24; A01K 3/00
U.S. Cl. 174—208 6 Claims

1. A plastic corner post insulator for electric fences comprising a generally U-shaped body which includes first and second rigid legs and a rigid shank connected to one end of each leg and extending therebetween, and a spring arm connected at one end to the other end of said first leg and extending toward and beyond the other or free end of said second leg, said second leg having a transverse groove located on the side thereof remote from said first leg and spaced from said other or free end of said second leg, said spring arm having a hook at its other or free end including a jaw element offset from said spring arm and engageable in said transverse groove to main-

tain said hook in a latched condition, whereby a length of electric fence wire can be retained within the opening formed



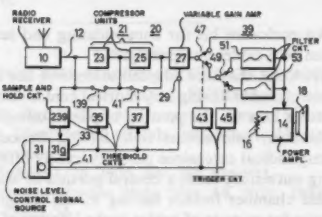
by said U-shaped body and spring arm when said jaw element is engaged in said transverse groove.

4,061,874

SYSTEM FOR REPRODUCING SOUND INFORMATION

J. P. Fricke, Wullnerstrasse 100, Cologne, and Ulrich R. Müller, Siegstrasse 2, Lovenich, both of Germany

Filed June 3, 1976, Ser. No. 692,441
Int. Cl.² H03G *3/20, 9/18*
U.S. Cl. 179—1 P **8 Claims**



1. A system for reproducing sound information in an environment impaired by noise of varying level, said system comprising:

A signal processing circuit having input means for receiving an input signal conveying audio information, output means for providing an output signal conveying processed audio information, and at least one signal path coupling said input and output means, said audio information occupying a given frequency band and having a given dynamic range; and

a control signal source providing a control signal related to said noise level;

said signal path comprising amplifier means operative in at least a first portion of said frequency band to amplify said input signal,

first means responsive to said control signal to vary the amplification provided by said amplifier means as a first direct function of said noise level,

signal compressor means operative in at least a second portion of said frequency band, and

second means responsive to said control signal to reduce the dynamic range of the signal in said at least second portion as a second direct function of said noise level, to provide an output signal which is boosted and dynamically compressed in at least a portion of said frequency band.

4,061,875

AUDIO PROCESSOR FOR USE IN HIGH NOISE ENVIRONMENTS

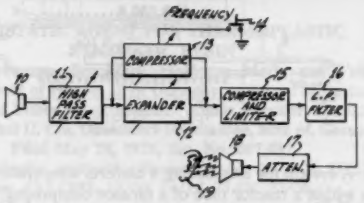
Stephen Freifeld, 55 Lancaster Court, New Providence, N.J. 07974, and Paul Yanick, Jr., 673 Wood Ave., Edison, N.J. 08817

Filed Feb. 22, 1977, Ser. No. 770,618
Int. Cl.² H04M *1/19*
U.S. Cl. 179—1 P **21 Claims**

1. Audio processor apparatus for providing protection against high intensity noise levels, while relatively restoring auditory acuity for a user with a normal hearing function in a noisy environment, comprising:

a. Means responsive to a range of audio signals including noise as propagating in an environment, for providing at an output an electrical signal indicative of said range;

b. a A high pass filter responsive to said electrical signal for substantially attenuating a given predetermined lower frequency portion of said range according to the type of noise present in said environment, to provide a limited range signal at an output;



c. Audio processing means including an expander for expanding the range of said limited signal according to the type of noise present, to provide an expanded range signal at an output;

d. Compressor means coupled to said expander and operative to limit the level of said expanded range signal;

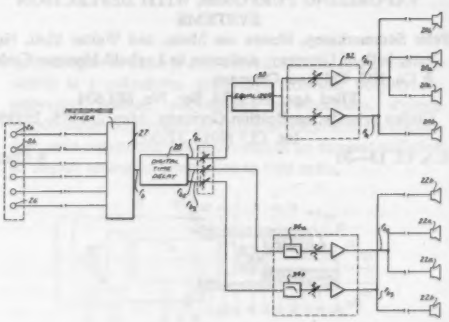
e. Means coupled to said compressor means for providing at an output an audible signal manifesting frequency and intensity characteristics sufficient to compensate for said noise of said environment, whereby a user is provided with said audible signal to restore normal acuity.

4,061,876

ELECTRONIC SOUND ENHANCING SYSTEM

J. Christopher Jaffe, Norwalk, Conn., assignor to Jaffe Acoustics, Inc., Norwalk, Conn.

Filed Sept. 26, 1975, Ser. No. 617,215
Int. Cl.² H04R *3/00*
U.S. Cl. 179—1 AT **6 Claims**



1. An electronic sound enhancing system for use in improving the symphonic criteria of sound emanating from a performing shell comprising in combination microphone means for receiving sound emanating from said performing shell and converting same to an audio signal, time delay means coupled to said microphone means for receiving said audio signal and respectively producing an audio signal delayed by a first time interval and an audio signal delayed by a second time interval, low pass filter means coupled to said time delay means for receiving said audio signal delayed by a first time interval and producing a narrow range audio signal, reverberant field loudspeaker means positioned with respect to said performing shell for receiving said narrow range audio signals delayed by a first time interval to thereby produce narrow range reverberant

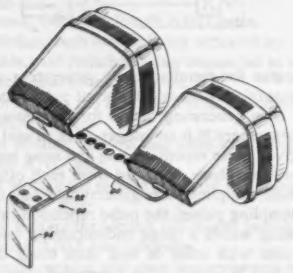
field sound, and forestage canopy loudspeaker means disposed proximate to said performing shell for simulating a forestage canopy panel by emitting sounds representative of early first reflections of said sound emanating from said performing shell in response to said audio signal delayed by a second time interval being applied thereto.

4,061,877

SPEAKER SYSTEM

William W. Phillips, Rancho Palos Verdes, Calif., assignor to Shaymar, Inc., Beverly Hills, Calif.

Filed Oct. 4, 1976, Ser. No. 728,933
Int. Cl.² H04R 1/32
U.S. Cl. 179—1 E **10 Claims**



1. A stereo speaker system structure for mounting on the back of a seat which may include a headrest near its top, comprising:

two loud speaker assemblies, each including at least one loud speaker;

an enclosure for each of said loud speaker assemblies, comprising a shell of rigid material substantially surrounding said loud speaker assembly on all sides to form a chamber substantially occupied by said loud speaker assembly and narrowing on one side to form a duct for directing sound produced by said loud speaker assembly;

at least one rigid spacer comprising an elongated member having means for attaching each enclosure to it at a preselected location along its length to form a system structure comprising two of said enclosures held in a spaced-apart relationship by said at least one rigid spacer; and,

means for attaching a strap to the system structure for mounting it on the back of a seat.

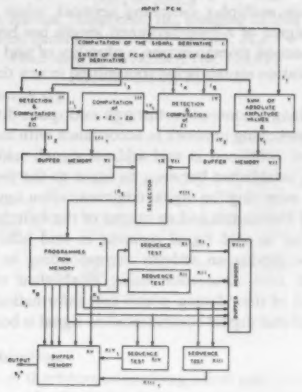
4,061,878

METHOD AND APPARATUS FOR SPEECH DETECTION OF PCM MULTIPLEXED VOICE CHANNELS

Jean-Pierre Adoul, Sherbrooke, and Fouad Daaboul, Ottawa, both of Canada, assignors to Universite de Sherbrooke, Canada

Filed May 10, 1976, Ser. No. 684,849
Int. Cl.² G10L 1/04
U.S. Cl. 179—1 SC **12 Claims**

1. A speech detector for use in a PCM multiplexed voice channel system comprising: means for processing a predetermined batch of consecutive PCM samples; means for sequentially computing a series of parameters during processing of said predetermined batch of consecutive PCM samples, said parameters consisting of a function of the amplitude of the vocal signal, the zero crossing of the voice signal, the zero crossing of the derivative of the vocal signal; and means for determining the status of each channel from information received as a result of the computing of said parameters over said predetermined batch.

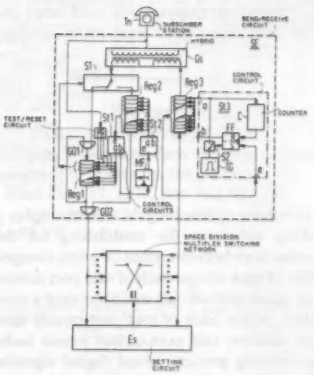


4,061,879

METHOD AND APPARATUS FOR TRANSMITTING DIGITAL INFORMATION SIGNALS FROM SIGNAL TRANSMITTERS TO SIGNAL RECEIVERS OVER SWITCHING APPARATUS

Klaus Wintzer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 29, 1975, Ser. No. 617,526
Claims priority, application Germany, Sept. 30, 1974, 2446696; Apr. 30, 1975, 2519445; May 22, 1975, 2522759
Int. Cl.² H04J 6/00
U.S. Cl. 179—15 BA **19 Claims**



1. A method for serially transmitting digital communication signals from a signal transmitter in one subscriber station to a signal receiver in another subscriber station by means of a space division multiplex switching network, comprising the steps of:

generating in said signal transmitter digital communication signals, each digital communication signal being constituted by an information signal and having an address signal prefixed thereto indicating the specific signal receiver to which the communication signal is to be transmitted,

storing said address signal, prior to transmission, in a first storage means in said signal transmitter,

storing said information signal, prior to transmission, in a second register in said signal receiver,

transmitting said digital communication signal to said space division multiplex switching network when an information signal of a predetermined length has been stored in said second storage means, a plurality of said digital communication signals being transmitted in any time sequence and

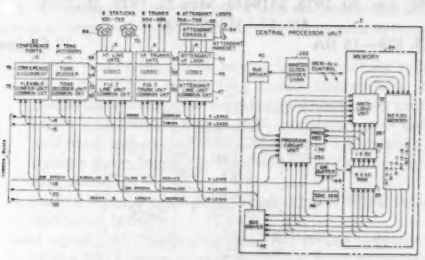
establishing a connection through said space division multiplex switching network in accordance with location information contained in said address signal, said connection being established between an input to the switching network receiving the digital communication signal from said signal transmitter and an output of the switching network coupled to said signal receiver in said other subscriber station having an address corresponding to the address signal, said connection being established only for the period of time during which said information signal portion of said digital communication signal is being transmitted.

4,061,880

TIME-MULTIPLEX PROGRAMMABLE SWITCHING APPARATUS

Galen R. Collins, Novato, Calif.; George A. May, Surrey, Canada, and Indra Lee Gendo, Novato, Calif., assignors to Dicom Systems, Ltd., Vancouver, Canada

Filed Mar. 21, 1975, Ser. No. 560,981
Int. Cl.² H04J 6/00
U.S. Cl. 179—15 BA **16 Claims**



8. In a telephone system, digital time-multiplex programmable switching apparatus for establishing on demand, time shared connections between pairs of ports comprising

a plurality of port means, each of said port means comprising one or more port circuit means having a common buffer memory means, each of said port circuit means having a unique address, said port circuit means including means for generating predetermined digital signaling signals in response to particular condition at said port circuit means and said port circuit means further including means for generating digital information signals when an information input signal is applied,

central processor unit means including memory means having a plurality of recirculating slots and means for inserting in said memory means slots pairs of port circuit means addresses and information signals directed to said addresses in response to said signaling signals from said port circuit means to establish time-multiplex information exchanging connections between said pairs of port circuit means, and

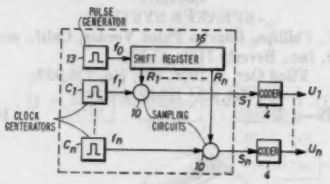
common bus means interconnecting all of said plurality of port means and said central processor means.

4,061,881

METHOD AND APPARATUS FOR GENERATING A NUMBER OF WEAKLY CORRELATED PSEUDORANDOM PULSE TRAINS

Walter Herbert Erwin Widl, Bandhagen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed July 19, 1976, Ser. No. 706,928
Claims priority, application Sweden, Aug. 15, 1975, 7509183
Int. Cl.² H04J 3/00
U.S. Cl. 179—15 BF **8 Claims**



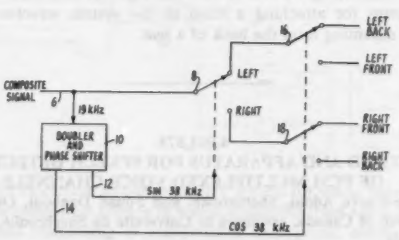
2. Apparatus for simultaneously generating a plurality of parallel trains of variable-width output pulses comprising parallel pulse train generating means for generating N trains of binary pulses, where N is an integer, each of said trains having the same given pulse repetition rate and same sequential pulse patterns but time-phase displaced from each other by at least one pulse time, sampling pulse generating means for generating N sets of sampling pulses, the pulse repetition rates of each of said sets being within a range encompassing said given pulse repetition rate with some of said rates being different from each other, and N output pulse generating means for generating output pulses, each of said output pulse generating means having input means for receiving one of said sets of sampling pulses and one of said trains of binary pulses and including means for initiating an output pulse when there is a coincidence of a sampling pulse and a binary pulse and for terminating the output pulse when a binary pulse is not present during the occurrence of a sampling pulse.

4,061,882

QUADRATURE MULTIPLYING FOUR-CHANNEL DEMODULATOR

Louis Dorren, San Mateo, Calif., assignor to Quadracast Systems, Inc., San Mateo, Calif.

Filed Aug. 13, 1976, Ser. No. 714,034
Int. Cl.² H04H 5/00
U.S. Cl. 179—15 BT **5 Claims**



1. A decoder for composite FM signal wherein the composite signal has a main channel having first, second, third and fourth bits of information thereon, a pilot signal removed from said main channel, a first subchannel having a frequency twice that of said pilot signal having two carriers in quadrature thereon, namely, a sine carrier containing plus first plus second minus third minus fourth information and a cosine carrier containing plus first minus second minus third plus fourth information thereon and a second subchannel at a frequency twice that of said first subchannel containing plus first minus

second plus third minus fourth information thereon, wherein the improvement consists of a means of demodulating the above-described four channel composite signal, such means comprising in combination:

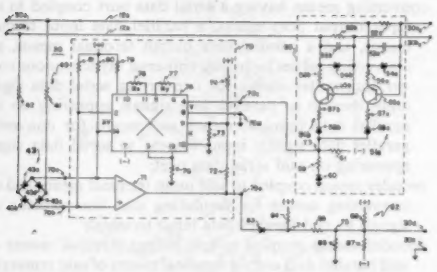
a. means for extracting said pilot signal;
b. means for doubling said pilot signal to yield a first switching signal representing the sine carrier of the first subchannel;
c. means for inverting said first signal to provide a second switching signal 180° out of phase with said first switching signal;
d. means for doubling and shifting the phase of said pilot signal to provide a third switching signal 90° out of phase with said first switching signal representing the cosine carrier of said first subchannel;
e. means for inverting said third signal to provide a fourth switching signal 180° out of phase with said third switching signal;
f. first, second, third and fourth AND gates,
g. four switches, each switch being actuated by one of said AND gates, said switches being connected to switch said composite signal to four outputs;
h. means for feeding the first and fourth switching signals to the first AND gate;
i. means for feeding the first and third switching signals to the second AND gate;
j. means for feeding the second and third switching signals to the third AND gate;
k. means for feeding the second and fourth switching signals to the fourth AND gate whereby,
l. the output of each of said switches represents one of said bits of information.

4,061,883

REPEATER FOR TRANSMISSION LINES OF DIFFERING LENGTHS

Charles W. Chambers, Jr., Amherst, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Division of Ser. No. 560,257, March 20, 1975, Pat. No. 3,989,907. This application July 12, 1976, Ser. No. 704,446
Int. Cl.² H04M *3/46*
U.S. Cl. 179—16 F **3 Claims**



1. In a circuit for establishing a control signal which is indicative of the a-c losses of a telephone transmission line, the combination of:

voltage sensing means for sensing the voltage across the transmission line and for establishing a line voltage signal which varies in accordance therewith;

current sensing means for sensing the current in the transmission line and for establishing a line current signal which varies in accordance therewith; and

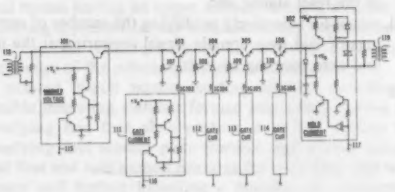
analog dividing means for generating a control signal which is proportional to the a-c losses of the transmission line by dividing the line voltage signal by the line current signal.

4,061,884

ARRANGEMENT FOR CONTROLLING THYRISTOR NETWORKS

James Mark Adrian, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 5, 1976, Ser. No. 712,012
Int. Cl.² H04Q *3/50*
U.S. Cl. 179—18 GF **15 Claims**



1. In combination:

a plurality of thyristors comprising a first and a last thyristor wherein each of said thyristors comprise a main conduction path between a first and a second electrode and a control path between said first electrode and a gate electrode;

connecting means for serially connecting the main conduction paths of said thyristors by connecting the second electrode of each thyristor, except the last thyristor, to the first electrode of a subsequent thyristor;

marking means for applying a marking potential to the first electrode of said first thyristor;

control current generator means connected to said gate electrodes for producing control currents, equal to or greater than the holding current of said thyristors, in the control paths of each of said thryistors in sequence and overlapped in time, from said first to said last thyristor; and

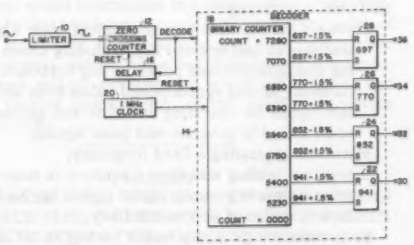
holding means connected to said last thyristor for producing a current, equal to or greater than the holding current of said thyristors, in the main conduction paths of said thyristors.

4,061,885

DIGITAL TONE DECODER

Harold Garth Nash, Tempe, and Jack Whitmore, Phoenix, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Dec. 17, 1975, Ser. No. 641,453
Int. Cl.² H04M *1/50*
U.S. Cl. 179—84 VF **10 Claims**



1. A digital tone decoder comprising:

a. means for generating a timing signal;

b. zero crossing counter means for generating a decode signal after a predetermined number of zero crossings in response to an incoming time domain signal and for generating a reset signal at a predetermined time after the de-

code signal is sent to reset said zero crossing counter means to zero;

c. decoder means coupled to said zero crossing counter and to said timing means for generating an output signal at one of a plurality of output terminals corresponding to the frequency of the incoming signal upon receipt of the decode signal from said zero crossing counter means, said decoder means being reset to an initial state upon receipt of the reset signal; and

d. means for selectively modifying the number of zero crossings of said time domain signal appearing at the input to said zero crossing counter

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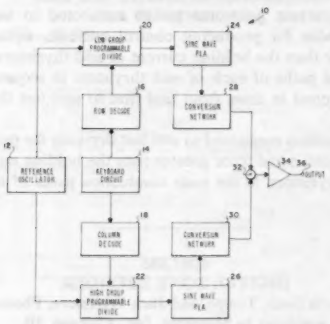
4,061,886

DUAL TONE MULTIPLE FREQUENCY GENERATOR

Michael James Callahan, Jr., Garland, and Gordon Bates Hoffman, Dallas, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Sept. 29, 1975, Ser. No. 617,955
Int. Cl.² H04M *1/26*
U.S. Cl. 179—84 VF **25 Claims**



1. A multiple frequency signal generator on an MOS integrated circuitry chip for providing a dual-tone output signal representative of a selected key on a keyboard connected to said chip, comprising:

keyboard decode means for generating pulse signals representative of said selected key, including means for directing first synchronized pulses to said keyboard, means for receiving second synchronized pulses from said keyboard and means for decoding said first and second synchronized pulses to generate said pulse signals;

means for generating a fixed frequency;

means for dividing said fixed frequency in response to said pulse signals to generate digital signals having frequencies representative of said selected key;

programmed logic array means having an MOS read-only memory matrix for translating said digital signals to digitally coded signals having code values representative of sinusoidal waveforms; and

conversion means for converting said digitally coded signals to analog sine wave signals having frequencies representative of said selected key; and

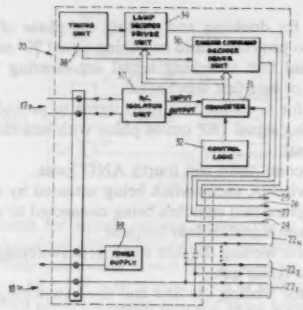
output means for combining said sine wave signals to generate said dual-tone signal on the output of said chip.

4,061,887

KEY TELEPHONE ADAPTER FOR ELECTRONIC TELEPHONE SWITCHING SYSTEM

James M. Kasson, San Mateo, and Samuel F. Wood, Los Altos Hills, both of Calif., assignors to Rolm Corporation, Cupertino, Calif.

Filed Apr. 23, 1976, Ser. No. 679,632
Int. Cl.² H04M *1/00*
U.S. Cl. 179—99 **2 Claims**



1. An apparatus responsive to a predetermined polling command from an electronic branch exchange for converting signals representative of the status of each line of a line selector unit of a standard multi-line key telephone instrument to serial data signals for transfer to said electronic branch exchange via a pair of data signal conductors and for converting serial data command signals received from said branch exchange via said pair of data signal conductors to command signals specifying operation of a plurality of line status indicators in said key telephone instrument, said apparatus comprising:

input/output port means adapted to be coupled to said pair of data signal conductors and including D.C. isolation means;

input terminal means adapted to be coupled to said line selector unit;

output terminal means adapted to be coupled to said line status indicators;

converting means having a serial data port coupled to said input/output port means, a parallel data input terminal means, and a parallel data output terminal means, said converting means including universal asynchronous receiver/transmitter means for converting serial data signals input thereto to parallel data signals appearing on said parallel data terminal means and means for converting parallel data signals input thereto to serial data signals appearing on said serial data port;

encoder means coupled to said input terminal means and said converting means for furnishing said line selector unit signals to said parallel data input terminal;

decoder means coupled to said output terminal means and said parallel data output terminal means of said converting means for furnishing said line status indicator command signals to said output terminal means;

control means responsive to receipt of said predetermined polling command by said converting means for enabling said converting means to generate said serial data signals from said line selector unit signals and for enabling said serial data signals to be coupled to said input/output port means, and responsive to receipt of said data command signals for enabling said converting means to generate said parallel data signals from said incoming serial data signals appearing at said input/output port means and for enabling said decoding means to couple said command signals to said output terminal means,

said encoder means including status change detector means for generating a control signal for conditioning said con-

trol means whenever said line selector unit signals are altered,

said decoder means including a ringing command decoder/driver unit selectively responsive to a first group of said data command signals for generating a first group of said line status indicator command signals, and a lamp command decoder/driver unit selectively responsive to a second group of said data command signals for generating a second group of said line status indicator command signals,

said ringing command decoder/driver unit comprising a ringing command decoder, a ringing logic circuit coupled to said ringing command decoder, and a ringing circuit coupled to said ringing logic circuit;

first timing means for generating a first periodic waveform of a first frequency on a first terminal, said first terminal being coupled to said ringing logic circuit;

said lamp command decoder/driver unit including a plurality of lamp driver circuits, means for storing said command signals from said second group in an ordered sequence with each said stored command signal being associated with a different one of said driver circuits, and means for sequentially enabling said plurality of lamp driver circuits in accordance with the corresponding stored command signal; and

second timing means for generating a pair of periodic signals of different frequencies,

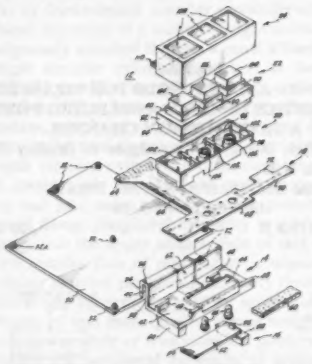
said lamp command decoder/driver unit further including means for selectively applying said periodic signals to said sequential enabling means in order to modulate the actuation of individual ones of said plurality of lamp driver circuits.

4,061,888

CONTROL UNIT MOUNTING AND INTERCONNECTING APPARATUS FOR TELEPHONE SETS

Harry R. Rasmussen, Tacoma, Wash., assignor to Crest Industries, Inc., Puyallup, Wash.

Filed Aug. 12, 1976, Ser. No. 713,870
Int. Cl.² H04M *1/02*
U.S. Cl. 179—100 D **10 Claims**



1. An apparatus for mounting a control unit, the control unit comprising manually-operable switch means having a base portion on which are arranged, in spaced-apart relation, a plurality of electrical switch terminals, on a telephone desk set which includes a substantially planar base having an upstanding peripheral flange and a removable cover having a downstanding peripheral wall extending over the flange in assembly, and for electrically interconnecting the electrical switch terminals of the control unit with a plurality of electrical terminals located on a printed circuit board to be installed within the telephone desk set, said apparatus comprising:

a. a base member including a first plate portion for supporting the printed circuit board within the telephone desk set, said first plate portion having an upper surface and a substantially planar lower surface formed to lie on the substantially planar base totally within the flange thereof, a second plate portion which is to be located external to the telephone desk set in assembly, said second plate portion having an upper surface formed to receive the base portion of the control unit, and a lower surface and wall means joining said first and second plate portions, said wall means having an upper surface defining a recess for receiving a printed circuit interconnecting element and a lower surface defining a recess for receiving a portion of the flange of the substantially planar base; and,

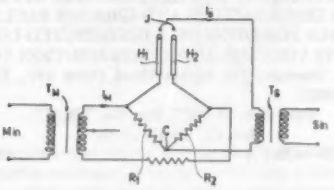
b. a printed circuit interconnecting element including a flexible insulating member formed into a first portion for overlying said first plate portion, a second portion for overlying said second plate portion, and a strip joining said first and said second portions for overlying said wall means and further including a plurality of conductors located on said flexible insulating member and having respective terminals in said first and said second portions adapted to be electrically connected to the plurality of electrical terminals located on the printed circuit board within the telephone desk set and to the plurality of electrical switch terminals of the control unit, respectively.

4,061,889

FILM WITH LIGHT SOUND TRACK CARRYING THE STEREOPHONIC SOUND INFORMATION; RIBBON LIGHT VALVE FOR PROVIDING THE LIGHT SOUND TRACK AS WELL AS LIGHT SOUND ADAPTER FOR REPRODUCING THE INFORMATION RECORDED ON LIGHT SOUND TRACK

Gabor Erdelyi, Lumumba Street 174, Budapest XIV, Hungary

Continuation of Ser. No. 404,713, Oct. 9, 1973, abandoned. This application Oct. 20, 1975, Ser. No. 624,165
Int. Cl.² G11B *7/20*
U.S. Cl. 179—100.3 T **3 Claims**



1. A film having a light-sound track carrying first and second stereophonic sound information and comprising a film body and along said film body a light sound track carrying stereophonic sound information in a curve with varied width, said curve having two boundries and a center line the width of the curve modulated transversely by said first stereophonic sound information and the center line of the curve being modulated by said second stereophonic sound information, said boundries varying independently of one another to provide said varied width.

4,061,890

LOUDSPEAKER WITH SINGLE LAYER RECTANGULAR WIRE VOICE COIL WOUND ON SLIT METAL BOBBIN WITH A NOTCH IN THE ADJACENT POLE PLATE

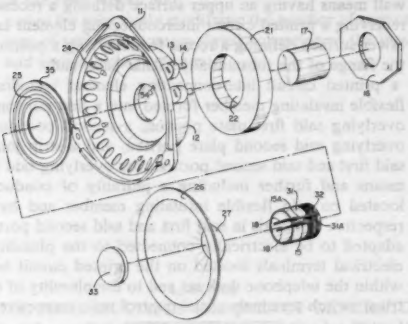
Thomas A. Froeschle, Framingham, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Aug. 27, 1976, Ser. No. 718,112
Int. Cl.² H04R *9/04*
U.S. Cl. 179—115.5 VC **4 Claims**

1. In a loudspeaker assembly including a basket, diaphragm and means defining an air gap having a magnetic field therein, the improvement comprising,

a single-layer voice coil formed by conducting wire of rectangular cross section wound upon a sheet metal bobbin having a longitudinal slit and an end portion of the conductor comprising the coil folded over from one end of the single layer to the other end,

the means defining an air gap including a front pole plate formed with a central opening that comprises means for defining the air gap and a notch extending radially outward from the central opening of area slightly greater than the cross sectional area of the folded-over end portion with the folded-over end portion passing through said notch in noncontacting relationship with said front pole plate,



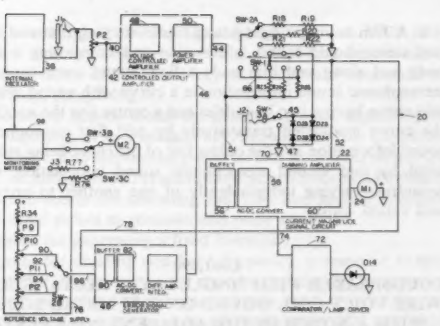
and means for supporting said voice coil and bobbin in said air gap to substantially fill said air gap while being in noncontacting relationship with said means defining an air gap.

4,061,891

TEST INSTRUMENT FOR DETERMINING APPARENT POWER CONSUMPTION AND GROUND FAULTS IN VARIOUS PORTIONS OF A DISTRIBUTED-LOAD, CONSTANT VOLTAGE AUDIO DISTRIBUTION SYSTEM

Wayne A. Pommer, 475 Mount Hood Drive SW., Issaquah, Wash. 98027

Filed Feb. 16, 1977, Ser. No. 769,387
Int. Cl.[2] H04R 29/00
U.S. Cl. 179—175.1 A **18 Claims**



1. A test instrument for determining apparent power consumption in various portions of a distributed-load, constant-voltage audio distribution system, comprising:

a. a controlled output amplifier having an input for receiving an audio input signal of a frequency at which the apparent power consumption is to be tested, a control signal, input, and an output which controlled amplifier produces an output signal at the test frequency of a voltage dependent on the magnitude of the signal received at the control signal input;

b. a resistance;

c. means for connecting the resistance to the output of the controlled amplifier;

d. means for connecting the resistance to that portion of the distributed-load, constant-voltage audio distribution system to be tested so that a test signal is applied to the portion of the system to be tested and the current that passes through the resistance is substantially equivalent to that which passes through that portion of the system to be tested;

e. means for supplying a reference voltage signal having a magnitude corresponding to the voltage at which the apparent power consumption is to be determined;

f. means, having inputs connected to the reference voltage supply means and the audio distribution system connection means and an output which is connected to the control signal input of the controlled amplifier, for producing an error signal at the output so that a test signal of a voltage corresponding to the voltage at which the apparent power consumption is to be determined is applied to the circuit under test at the audio distribution system connection means;

g. means connectable across the resistance for producing a signal having a magnitude indicative of the amount of current passing through the resistance; and

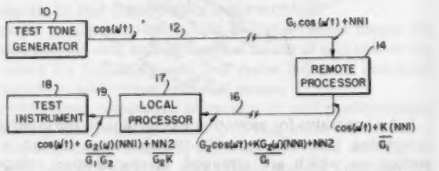
h. means connected to the current magnitude signal means for indicating the magnitude of the current passing through the resistance which indication is indicative of the apparent power consumed by the tested system.

4,061,892

INSTRUMENTS AND METHODS FOR MEASURING CHARACTERISTICS OF ONLY A SELECTED PORTION OF A TRANSMISSION CHANNEL

Frank R. Bradley, Bronx, N.Y., assignor to Bradley Telcom Corp., Leonia, N.J.

Filed Dec. 15, 1976, Ser. No. 750,614
Int. Cl.[2] H04B 3/46
U.S. Cl. 179—175.3 R **20 Claims**



18. A method for processing a received signal consisting of test tone and disturbance components and applying the processed signal to a test instrument comprising the steps of operating on the received signal to derive a signal proportional thereto but with the tone component level increased relative to the disturbance component level by a predetermined factor, and applying the derived signal to said test instrument.

4,061,893

SPRINKLER FLOW CONTROL SYSTEMS HAVING CONTINUOUS CYCLE TIMER AND ASSOCIATED APPARATUS DISPOSED IN A HERMETICALLY SEALED HOUSING

George E. Sanner, P.O. Box 10707, Towson, Md. 21204

Division of Ser. No. 625,350, Oct. 25, 1975, Pat. No. 4,014,359, which is a continuation-in-part of Ser. No. 466,693, May 3, 1974, Pat. No. 3,915,185, which is a continuation-in-part of Ser. No. 272,793, June 18, 1972, Pat. No. 3,848,616, which is a continuation-in-part of Ser. No. 18,829, Feb. 12, 1970, abandoned, which is a division of Ser. No. 456,787, May 18, 1965, Pat. No. 3,500,844. This application Apr. 14, 1976, Ser. No. 676,877

Int. Cl.[2] H01H *7/00, 43/00*

U.S. Cl. 200—38 D .63 Claims

1. An electrical timer switch control means comprising: timer means, a time switch, timer operating means, timer switch operating means, and time switch circuit means; an electrical load in a casing; said casing having a main quadric or frustoconical member the tapered peripheral extremity of which circumferentially abuts the peripheral extremity of a flat bottom cover thereby enclosing the bottom of said main frustoconical member, and the opposite peripheral extremity of said quadric or frustoconical member circumferentially abuts one peripheral extremity of a section of right circular cylinder and is contiguously attached thereto, a panel affixed to and closing said right circular cylindrical section at the opposite end thereof, said panel having a flat portion spanning said cylindrical member with a flange around the periphery of said panel flat portion, peripheral extremity of said panel flange in contiguous circumferential abutment with the peripheral extremity of said right circular cylinder; a continuous annular gasket inserted contiguously between said panel flange peripheral extremity and said main casing member peripheral extremity, said panel flange peripheral extremity is sandwiched circumferentially into the upper annular face of said gasket, and the opposite annular face of said gasket is telescoped over said main casing member peripheral extremity thereby providing a hermetical seal between the exterior surface of said panel and the interior of said main quadric casing member; a top cover comprising a quadric or frustroconical portion and a cylindrical portion the peripheral extremity of which is telescoped over the exterior surface of said panel peripheral flange and abuts circumferentially said upper annular face of said annular gasket thereby providing a hermetical seal between the exterior surface of said top cover and the exterior surface of said panel; said timer means and said timer operating means disposed on the exterior surface of said panel, being non-electrical; said timer means, said time switch, and said timer operating means disposed on the interior surface of said panel, being electrical; said timer operating means disposed on the interior surface of said panel motivating said timer means disposed on the exterior surface of said panel, by means of a single rotating drive shaft that protrudes through a hermetically sealed bushing extending from said panel interior surface to said panel exterior surface; said timer switch operating means disposed on said panel exterior surface actuating said timer switch operating means and said time switch, disposed on said panel interior surface by means of a single angularly oscillating drive shaft means protruding through a hermetically sealed bushing extending from said panel interior surface to said panel exterior surface; means accessible from the exterior of said casing for connecting an external power source to said timer operating means and for connecting said external power source in series with said electrical load and said time switch; and said timer operating means motivating said timer switch operating means causing said time switch to open and close in an automatically repetative cycle thereby energizing and de-energizing said load by means of said timer means.

4,061,894

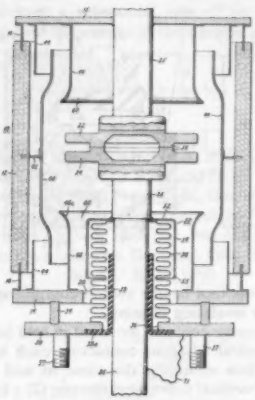
VACUUM-TYPE CIRCUIT INTERRUPTER WITH IMPROVED PROTECTION FOR BELLOWS

Donald Wayne Crouch, Newtown Square, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Apr. 28, 1976, Ser. No. 681,008

Int. Cl.[2] H01L *33/66*

U.S. Cl. 200—144 B 6 Claims



1. A vacuum-type circuit interrupter comprising:

a. a highly-evacuated envelope comprising a tubular casing of insulating material and a metal end cap that contains an aperture and is joined in sealed relationship to said casing at one end of said casing,

b. separable contacts primarily of beryllium located within said envelope,

c. a movable conductive contact rod extending freely through said aperture in said end cap and carrying one of said contacts at one end thereof,

d. a plate located at the outer side of said end cap and joined to said end cap in sealed relationship thereto, said plate being spaced from said end cap and containing an opening through which said movable contact rod freely extends,

e. a flexible metal bellows of generally tubular form surrounding said contact rod and having its axially-inner end joined to said contact rod and its axially-outer end joined to said plate, said bellows extending freely through said aperture in said end cap,

f. a cup-shaped metal shield for said bellows comprising:

f_1. an end wall joined to said contact rod near said inner end of the bellows, and

f_2. a tubular body portion projecting from said end wall and surrounding said bellows along a portion of the bellows length, the free-end region of said tubular body portion being located substantially within said aperture during at least the final portion of an opening stroke of

the movable contact rod, with only a small clearance between said aperture and said free-end region,

g. a metal main shield within said casing, surrounding said contacts, and normally electrically isolated from said contacts for condensing beryllium vapors generated by arcing between said contacts, said main shield having an end portion surrounding said cup-shaped bellows shield,

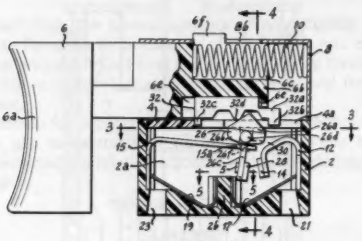
h. a metal end shield mounted on said end cap and electrically connected thereto, said end shield having a tubular portion surrounding the tubular portion of said cup-shaped shield and disposed between said tubular portion of the cup-shaped shield and the end portion of said main shield in radially-spaced relation to said end portion, the region between the tubular portions of said cup-shaped shield and said end shield being a region of very low electric stress.

4,061,895

HIGHER RATED DOUBLE-POLE TRIGGER SWITCH

Harold W. Hults, New Berlin, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Jan. 21, 1976, Ser. No. 651,171
Int. Cl.[2] H01H 9/06, 13/08
U.S. Cl. 200—157 **23 Claims**



1. A double-pole tool handle switch comprising:

an electrically insulating housing;

a pair of stationary contacts mounted in said housing;

a pair of identical adjacent contactors each having: (1) a middle portion mounting the same to said housing for pivotal and vertical movement therein; (2) a lower portion carrying a movable contact for engaging the respective stationary contact in one direction of pivoting of said contactor and for disengaging said respective stationary contact in another direction of pivoting of said contactor; and (3) an upper portion having a pair of oppositely inclined camming surfaces forming an apex at their junction;

limiting means in said housing limiting the pivoting of each contactor in said other direction;

a pair of resilient cantilever terminals in electrical engagement with respective contactors, each terminal having one end mounted to said housing and the other end biasing the respective contactor upwardly;

an operator slidably mounted to said housing;

cam means slidably mounted to said operator for limited motion therealong between first and second limited positions relative thereto and arranged to engage said camming surfaces of said contactors; and

stop means in said housing for limiting the movement of said cam means relative thereto between forward and rearward positions such that said cam means is continuously in engagement with camming surfaces of said contactors to stop the upward movement thereof thereby effecting a torque on said contactors about said middle portions;

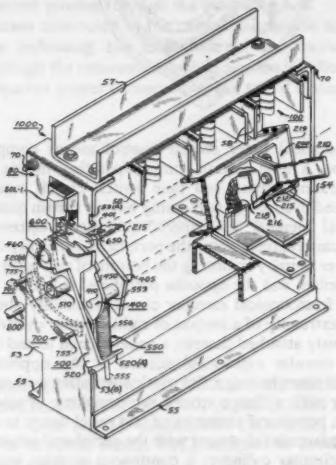
such that during operation of said operator said cam means slides along said operator to said first limited position, after which said cam means is carried by said operator and slides across one of said inclined surfaces of each contactor causing downward movement of said contactors until said cam crosses said apex of each contactor, after which a reverse torque pivots the contactors to close said contacts and the contactors move upwardly as said cam means slides across the other of said inclined surfaces of each contactor to provide contact wiping, said cam means simultaneously sliding along said operator to said rearward position relative to said housing, and such that during return operation of said operator said cam means slides along said operator to said second limited position, after which said cam means is carried by said operator and slides across said other of said inclined surfaces of each contactor causing downward movement of said contactors to shear any welds formed between said contacts until said cam means crosses said apex of each contactor, after which said contactors pivot to open said contacts and move upwardly as said cam means slides across said one of said inclined surfaces of each contactor, said cam means simultaneously sliding along said operator to said forward position relative to said housing.

4,061,896

MODULAR VAULT-TYPE LOAD BREAK SWITCH

John F. Clancy, 440 Arizona Ave., Glenwood, Ill. 60425, and Clarence L. Welter, 131 Philip Lane, Valparaiso, Ind. 46383

Filed May 24, 1974, Ser. No. 472,969
Int. Cl.[2] H01H 9/20
U.S. Cl. 200—323 **10 Claims**



1. A modular vault-type load-break switch comprising

stationary electrical contact means for coupling to an electrical conductor to form an electrical circuit upon the closing of movable electrical contact means thereinto,

movable electrical contact means for coupling to an electrical conductor to form an electrical circuit upon closing into said stationary electrical contact means,

drive means operatively connected to said movable electrical contact means for applying a driving force thereto to close said movable electrical contact means into said stationary electrical contact means and to open said movable electrical contact means from engagement with said stationary electrical contact means,

control means operatively connected to said drive means for actuating said drive means to apply the driving force to said movable electrical contact means to effect movement of said movable electrical contact means in the direction in which said drive means applies the driving force, and

latch means for preventing the movement of said movable electrical contact means in a direction opposed to the movement effected by the driving force applied by said drive means thereby providing a positive closing of said

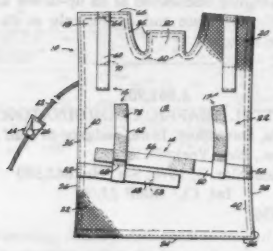
movable electrical contact means into said stationary electrical contact means and a positive opening of said movable electrical contact means from engagement with said stationary electrical contact means.

4,061,897

HEATING PAD

Audrae Thykeson, 8340 SW. 65 Ave., Miami, Fla. 33143

Filed Jan. 23, 1976, Ser. No. 651,713
Int. Cl.² H05B 1/00
U.S. Cl. 219—211 **7 Claims**



1. A heating pad comprising:

a main body portion formed of like front and back panels of a suitable fabric material, with a heating element sandwiched therebetween, said main body portion including an enlarged portion sized to selectively cover a predetermined portion of the back or front areas of the upper portion of a person's body, a pair of shoulder portions extending upwardly from said enlarged portion to engage over the respective shoulder areas of a person's body, and a neck portion, extending upwardly from said enlarged portion, to engage with back or front areas of a person's neck;

a generally transverse, adjustable belt means to maintain said enlarged portion in said selected position; and

a generally vertical, adjustable belt means, to maintain said shoulder portions in engagement over the shoulder areas.

4,061,898

HEAT CAP

John S. Murray, Granada Hills, and Sime Sunjara, Long Beach, both of Calif., assignors to Redken Laboratories, Inc., Canoga Park, Calif.

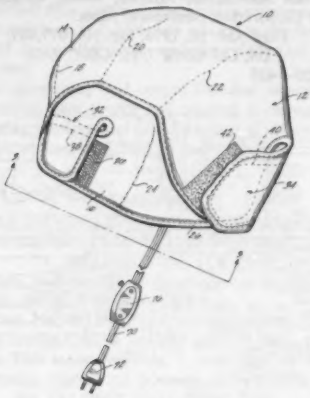
Filed Aug. 16, 1976, Ser. No. 714,851
Int. Cl.² H05B 1/00
U.S. Cl. 219—211 **43 Claims**

1. A hair processing cap for applying heat to hair on the head of a human being comprising:

flexible cap means having an outer cover, an inner liner, and a hollow interior between the outer cover and the inner liner;

the cap means having a generally spherically-shaped closed position to conform to the shape of the head and to cover the area of the head within the hairline, the cap means in said closed position having a lower peripheral edge encircling the head in the temple area thereof;

means for opening the cap comprising an elongated first split extending inwardly from the peripheral edge at one side of the cap, and an elongated second split extending inwardly from the peripheral edge at an opposite side of the cap; each split forming a separate flexible and independently movable flap; fastening means on each flap; and cooperating fastening means located on a portion of the cap means adjacent each respective flap, the fastening means enabling the flaps to be selectively attached to different areas of the cap in the vicinity of the first and second splits to vary the three-dimensional contour of the cap means to conform to the shape of the head; and



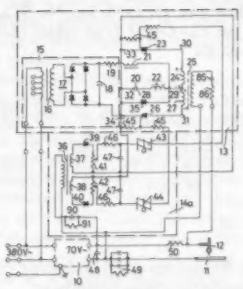
electrical heating means in the interior of the cap means and disposed over a substantial area of the cap means for directing heat outwardly to the portion of the head covered by the cap.

4,061,899

ARRANGEMENT FOR STABILIZATION AND IGNITION OF WELDING ARCS BY IGNITION PULSES

Max Gillitzer, Munich, and Franz Tajbl, Oberschleissheim, both of Germany, assignors to Messer Griesheim GmbH, Germany

Filed Oct. 15, 1975, Ser. No. 622,629
Claims priority, application Germany, Oct. 18, 1974, 2449557
Int. Cl.² B23K 9/06
U.S. Cl. 219—131 R **5 Claims**

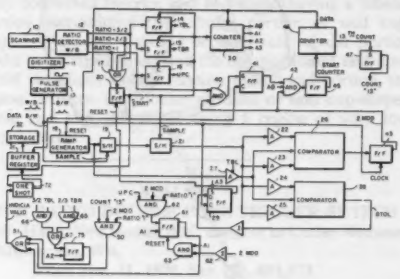


1. A device for stabilization of alternating current welding arcs and for the ignition of alternating current or direct current welding arcs by stablization or ignition pulses of alternate polarity, which pulses are generated by at least one discharged capacitor charged from a current source and discharged by a discharge circuit comprising two controllable discharge switches, rectifier means, and a pulse transformer with primary and secondary windings, each switch being connected to supply the transformer primary with discharge current in a different direction, the transformer secondary supplying the stabilization or ignition pulses, and the rectifier means being connected to form short-circuiting paths through the respective switches to dissipate from the transformer primary the energy liberated by its magnetic flux after each pulse, regardless of its polarity.

4,061,900
INDICIA VALIDATION SYSTEM

Francis John Masciarelli, Milford, Mass., assignor to Data General Corporation, Southboro, Mass.

Filed Apr. 16, 1976, Ser. No. 677,687
Int. Cl.[2] G06K 7/10; G08C 9/06
U.S. Cl. 235—437 **10 Claims**



1. A system for validating data derived from UPC encoded indicia comprising

a. first means for providing a first signal indicating a count of 13 B/W transitions after the UPC guard bars are detected from said indicia;

b. second means for providing a second signal indicating if a band pair ratio equal to 1 is present in said indicia;

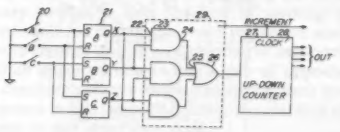
c. third means for generating a band pair tolerance signal from said indicia if said indicia is proper and

fourth means responsive to said first, second and band pair tolerance signal for generating an indicia valid signal if all said signals are present.

4,061,901
TELEMETERING SYSTEM

Jim G. Saunders, Mission Viejo, Calif., and Alfred B. Stucki, Brigham City, Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Aug. 19, 1976, Ser. No. 715,736
Int. Cl.[2] G06M 3/14; G01F 23/10
U.S. Cl. 235—92 EV **9 Claims**



1. A system for automatically preparing digital data to describe changing liquid levels, comprising:

shaft means;

a support for the shaft means;

means coacting for rotating the shaft means in response to linear motion of the changing liquid level;

a magnet fixed eccentrically for rotation relativve to the shaft means;

three sensors (A, B, and C) capable of switching an electric circuit in response to magnetic flux from said magnet;

said support including means for supporting the sensors relative to the shaft means, so that they are positioned equidistantly from the shaft means and sufficiently close thereto to respond to proximity of the magnet as it is rotated by the shaft means;

three flip-flops, each having an R input, an S input, and an output, the R input of each flip-flop being connected to one of the sensors and the S input being connected to one different sensor, so that, when one of the sensors switches the circuit, the inputs of two flip-flops are changed and, hence, the outputs of two flip-flops are changed, but the output of a third flip-flop remains unchanged, whereby the outputs of the three flip-flops can provide a three digit, binary code capable of distinguishing clockwise and counterclockwise rotation of the shaft means, since one digit of each code is determined by the previous switch;

three AND gates, each having two inputs and one output, each input being connected to two adjacent flip-flop outputs, as arranged in circular sequence;

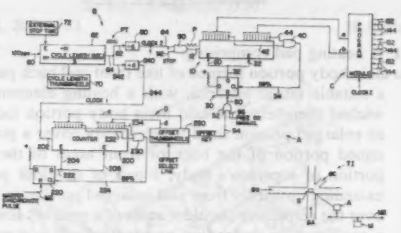
an OR gate having three inputs and an output, each input connected to an output of a different one of the AND gates; and

an up-down counter connected at its up-down input to the output of the OR gate and operatively at its increment input to the sensors.

4,061,902
DIGITAL TRAFFIC COORDINATOR

Francis L. Battle, Davenport, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed Mar. 3, 1976, Ser. No. 663,580
Int. Cl.[2] G06F 15/48
U.S. Cl. 364—436 **28 Claims**



1. A coordinator for creating a background cycle and controlled logic conditions on selected output circuits during said background cycle, said cycle and logic conditions being used in governing the signalization of a traffic intersection, said coordinator comprising: a pulse counter having an input means for receiving input counting pulses, a codeable output network for creating a coded binary pattern, means for changing said pattern incrementally and progressively between a first code representing a first number N_1 and a second code representing a second number N_2 upon receipt of input counting pulses at said input means, means for shifting said pulse counter to said number N_1 upon receipt of a shift signal and means for creating said shift signal when said pattern progresses to the number N_2; means for creating input counting pulses having a frequency corresponding to a desired cycle time; means for starting said counter upon receipt of an offset signal, said starting means includes a digital device for creating an offset signal at a selected time after a master synchronization pulse from a remote master controller; and decoding means for creating said selected logic conditions in selected output circuits when said pattern has a selected code corresponding to a number in the range of N_1 to N_2.

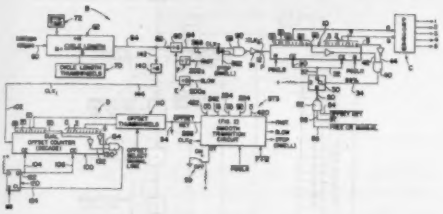
4,061,903
DIGITAL COORDINATOR WITH SMOOTH TRANSITION FOR OFFSET CHANGES

Francis L. Battle, Austin, Tex., assignor to Gulf & Western Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 663,580, March 3, 1976, This application July 30, 1976, Ser. No. 710,288
Int. Cl.[2] G06F 15/48
U.S. Cl. 364—436 **37 Claims**

1. In a digital coordinator for creating a background cycle defined by a series of control pulses repeatedly cycled between a first number, N_1, and a second number, N_2, with the time

space between the N_1 control pulse and the N_2 control pulse being a background cycle length, said coordinator comprising a primary pulse counter means incremented by input counting pulses for creating one in a series of said control pulses in response to a selected number of input counting pulses, said input counting pulses having a frequency for determining the cycle speed of progression of said control counts in successive count positions between the N_1 control pulse and the N_2 control pulse of a given background cycle, and shifting means for shifting said N_1 control pulse with respect to time to correspond in time with a signalization offset signal, the improvement comprising: said shifting means including a counting

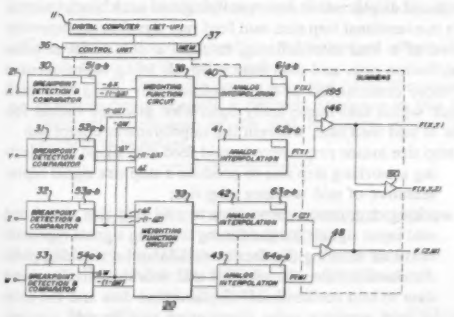


circuit for counting count pulses created by and corresponding to said input counting pulses during a given background cycle and from a selected count position in said given cycle; a response means for creating a control logic signal in response to a signalization offset signal occurring before a given count position in said given cycle; first means responsive to said control logic signal for creating a stop signal; second means responsive to said control logic signal for storing the number of count pulses counted by said counting circuit prior to said offset signal; means responsive to said stop signal for preventing said counting pulse from incrementing said primary counting means; and, means for holding said stop signal for a time controlled by said number of count pulses.

4,061,904
VARIABLE ANALOG FUNCTION GENERATOR

George Hannauer, E. Windsor, and Abhaya Asthana, Long Branch, both of N.J., assignors to Electronic Associates, Inc., Long Branch, N.J.

Filed Mar. 3, 1976, Ser. No. 663,297
Int. Cl.[2] G06J *1/00;* G06G *7/28*
U.S. Cl. 364—608 24 Claims



1. A variable analog function generator independent of external data source and control during time of generation of at least one predetermined output function of at least one input variable with said output function expressed in terms of hybrid variables each having an analog portion and a digital portion comprising

first dedicated memory means having stored therein data related to breakpoints defining the input variable,

second dedicated memory means having stored therein tables of values defining said digital portion,

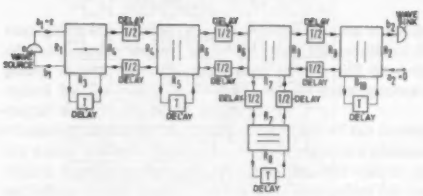
means for generating said analog portions independent of said external data source and control in response to (1) the input variable and (2) said data related to the breakpoints accessed in parallel from said first dedicated memory means, and,

means for generating said output function independent of said external data source and control in response to (1) said analog portions and (2) said tables of values accessed from said second dedicated memory means.

4,061,905
FILTER HAVING FREQUENCY-DEPENDENT TRANSMISSION PROPERTIES FOR ELECTRIC ANALOG SIGNALS

Alfred Fettweis, Bochum, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Division of Ser. No. 402,348, Oct. 1, 1973, Pat. No. 3,967,099, which is a continuation of Ser. No. 148,577, June 1, 1971, abandoned. This application Apr. 2, 1976, Ser. No. 672,884
Claims priority, application Germany, June 3, 1970, 2027303
Int. Cl.[2] G06F *15/34;* H03H *7/10*
U.S. Cl. 364—724 13 Claims



1. A filter for discrete signals,

a. said filter comprising a filter circuit operating on discrete signals and having a filter function for discrete signals corresponding to the frequency-dependent transmission properties for electric analog signals of an analog ladder structure having a predetermined configuration of interconnected analog components including at least three reactive analog components with respective impedance-representing constants;

b. said filter circuit for discrete signals having a plurality of port elements including ports each with a port input and a port output terminal, at least certain of said plurality of port elements corresponding in filter function to reactive analog components of the analog ladder structure and such certain port elements comprising time delay means interposed between port input and output terminals thereof, each time delay means providing a time delay which is a function of a given time interval and being operable for receiving an input signal from an associated input terminal at a discrete time and for supplying an output signal to an associated output terminal at a discrete time thereafter in accordance with said time delay; the ports of said port elements being assigned port impedance numbers in accordance with the impedance-representing constants of the analog ladder structure corresponding thereto, and

c. said filter circuit comprising interface device means having interface ports connected with the ports of said port elements and interconnecting the port elements in accordance with the configuration of said analog ladder structure, and said interface ports including sets of interface ports connecting with sets of port elements corresponding to sets of connected analog components of the analog ladder structure;

d. the interface device means having interface circuitry including adder means and multiplier means connected with each of the sets of interface ports for interchange of

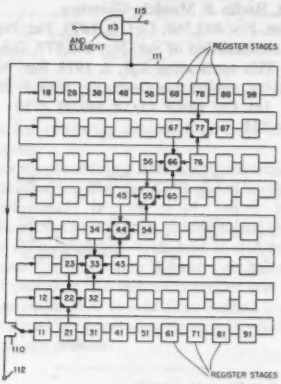
signals with ports of the port elements connected with such interface ports, each such multiplier means having a multiplier coefficient correlated with the port impedance numbers of the respective ports of said port elements interchanging signals therewith.

4,061,906

COMPUTER FOR NUMERIC CALCULATION OF A PLURALITY OF FUNCTIONALLY INTERRELATED DATA UNITS

Wolfgang Grebe, Enzianweg 10, Starnberg, and Siegfried Buhlmann, Hubertusstrasse 10, Neugermering, both of Germany

Filed Apr. 26, 1976, Ser. No. 680,197
Claims priority, application Germany, Apr. 28, 1975, 2518887
Int. Cl.[2] G06F *15/32*
U.S. Cl. 364—735 11 Claims



1. In a computer for numeric calculation of a plurality of functionally interrelated data units, each data unit corresponding to a point of a grid, the grid being arranged in rows and columns and covering a domain of solutions, using mathematical operations involving data units associated with grid points adjacent a preselected grid point and including a cyclic memory having at least as many storage cells as the grid has grid points, each storage cell storing a corresponding grid point data unit; means for storing information in at least one of the storage cells; shifting means for cyclically shifting cell-by-cell the information contained in the storage cells; a plurality of computing means, each computing means capable of being connected to more than one storage cell; and means for retrieving information from the cyclic memory when a calculation has been carried out, the improvement wherein:

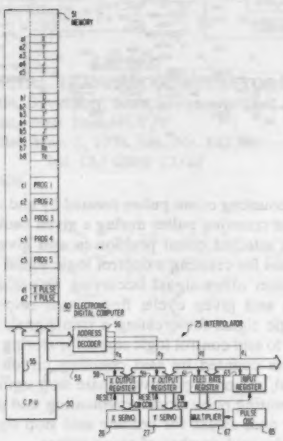
each storage cell includes a first memory location for storing the corresponding grid point data unit and a second memory location for storing a code associated with the grid point data unit stored in the first memory location, the code containing information for controlling and processing the grid point data unit stored in the first memory location; and wherein each computing means is connected to a respective preselected storage cell and the storage cells storing smultaneously, at a predetermined time of each complete shift cycle, the grid point data units of grid points adjacent, in row and column direction of the grid, the grid point corresponding to said respective preselected storage cell at the predetermined time, each computing means being controlled by the code stored in the second memory location of said respective preselected storage cell for calculating a new grid point data unit for the grid point corresponding to said respective preselected storage cell using the grid point data units of the adjacent grid points.

4,061,907

INTERPOLATOR FOR A NUMERICALLY CONTROLLED MACHINE WITH STEP SIZE SELECTED IN RESPONSE TO FEED RATE

Kiyokazu Okamoto, and Hitoshi Hayashi, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed July 19, 1976, Ser. No. 706,322
Claims priority, application Japan, July 17, 1975, 50-87710
Int. Cl.[2] G06F *15/46*
U.S. Cl. 364—718 4 Claims



1. An interpolator responsive to a set of input signals for each block for successively producing a plurality of distribution signals for a numerically controlled machine, said input signals comprising a set of displacement signals and a feed rate signal, said displacement signals being representative of conventional displacement data specifying said each block in terms of a conventional step size, said feed rate signal being representative of a feed rate defining, in turn, a conventional pulse distribution rate, said distribution signals being representative of those commanded positions substantially along said each block which said numerically controlled machine should follow at said feed rate, wherein the improvement comprises:

step size means responsive to said feed rate signal for selecting a working step size to produce a step size signal representative of said working step size;

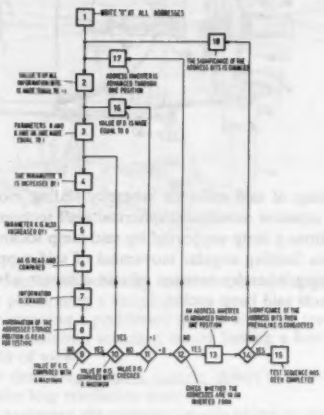
working data means responsive to said step size signal and said input signals for producing working signals representative of working displacement data and a working pulse distribution rate, the ratio of said working displacement data to said conventional displacement data and the ratio of said working pulse distribution rate to said conventional pulse distribution rate being substantially equal to the ratio of said conventional step size to said working step size; and

pulse distribution means responsive to said working signals for producing said distribution signals at said working pulse distribution rate, said distribution signals being now representative of said commanded positions in terms of said working step size.

4,061,908
METHOD OF AND DEVICE FOR TESTING A DIGITAL MEMORY

Jan Hendrik de Jonge, Beekbergen, and Adrianus Josephus Smulders, Hoogland, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 23, 1975, Ser. No. 643,622
Claims priority, application Netherlands, Dec. 23, 1974, 7416755
Int. Cl.² G11C *29/00*; H03K *5/18*
U.S. Cl. 235—302.3 11 Claims



1. A method of testing memories, in which a predetermined first number of discrete, random addressable, storage positions for binary information is provided with each storage position having a specific address, said first number being at least substantially equal to 2^N and the addresses containing N binary information elements of successive significance in accordance with a first order, comprising the steps of

filling the storage positions first with a first information,

subsequently reading the storage positions during a first cycle in accordance with a first address sequence for the purpose of testing in that the address is each time changed by one unit,

subsequently filling the addressed storage positions with changed information with respect to the read-out,

reading the storage positions again for the purpose of testing in accordance with the reverse of the first address sequence, and

filling again said storage positions with changed information with respect to the latter read-out,

repeating said first cycle during a second cycle, the storage positions being assigned a different sequence in that the order of significance of the said N binary information element is modified.

4,061,909
VARIABLE WAVEFORM SYNTHESIZER USING DIGITAL CIRCUITRY

A. William Bryant, 3457 Eye St., Eureka, Calif. 95501

Filed July 23, 1975, Ser. No. 598,500
Int. Cl.² H03K *13/00*
U.S. Cl. 364—851 7 Claims

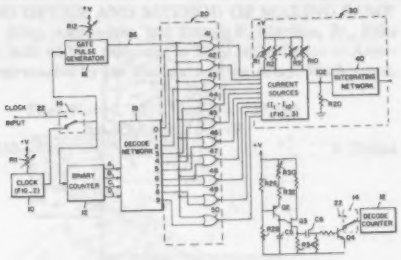
1. A variable waveform synthesizer for accepting a digital pulse train of a predetermined period and constructing therefrom a variety of multi-valued waveform approximations comprising:

counting means for receiving the digital pulse train and sequentially assuming in response thereto N separate and distinct digital states;

pulse generating means responsive to the digital pulse train for generating a digital pulse stream of pulses each of the pulses of the digital pulse stream being less than the predetermined period of the digital pulse train, the pulse generating means including means for varying the width of the pulses;

decoding means responsive to the counting means for decoding at most N digital states and including at most N individual outputs, each decoder output activated in a predetermined order in response to the digital states assumed by the counting means;

combining means responsive to the pulse generating means and the decoding means outputs and having a number of



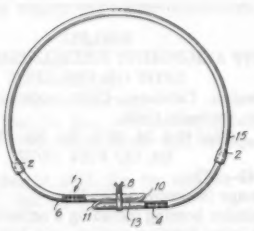
combining means outputs in one-to-one relation with each of the decoder means outputs so that the width of the pulses output from the combining means will be determined by the coincidence between the pulse generator output and the decoder outputs; and

synthesizing means for accepting the outputs of the combining means and generating therefrom a pulse of a predetermined amplitude for each activated decoder output and including output means responsive to said pulses for constructing therefrom a multi-valued waveform approximation.

4,061,910
LUMINESCENT JEWELRY

Steven Allen Rosenfeld, New York, N.Y., assignor to Barry G. Magidoff, New York, N.Y., a part interest

Filed Feb. 2, 1976, Ser. No. 654,506
Int. Cl.² F21V *9/16*; A44C *13/00*
U.S. Cl. 362—34 3 Claims



1. An article of jewelry adapted to be worn on the body of a person comprising wearing means for attaching the jewelry to the body of a wearer; a flexible walled tube formed of a light-transmitting material, sealed at both ends of the tube and being folded at two intermediate locations in such a manner that the opposing interior surfaces of the flexible tube walls are in sealing contact at these two locations, thereby defining a sealed intermediate chamber therebetween and at least two additional end chambers between each fold portion and its nearest sealed end; and a chemiluminescent component contained in each of the two end chambers, the intermediate chamber being substantially free of a chemiluminescent component, whereby unfolding the tube, so as to permit the interior walls

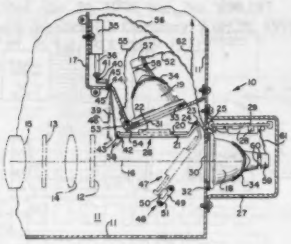
to move out of sealing contact permits the mixing of the components to produce chemiluminescence in a connected, single compartment.

4,061,911

AUTOMATICALLY SWITCHED SPARE LAMP FOR A LIGHT PROJECTOR

Thomas L. Krasin, Darien, Ill., assignor to Audio Visual Innovators Corporation, Darien, Ill.

Filed Apr. 14, 1976, Ser. No. 676,746
Int. Cl.² H05B *39/10*
U.S. Cl. 362—20 **10 Claims**



1. A lamp system for a projector, said projector having a frame and at least one projection lens with an optical axis associated therewith, said system comprising:

a main lamp with a highly directional light pattern fixedly mounted in relationship to said frame, said lamp and the light pattern thereof aligned with the optical axis of said projection lens;

a spare lamp with a highly directional light pattern fixedly mounted in relationship to said frame, at a location not in alignment with the optical axis of said projection lens;

sensing means for detecting the failure of said main lamp, and for automatically energizing said spare lamp upon failure of said main lamp; and

low mass reflecting means positionable between a first position whereat said reflecting means does not obstruct nor effect light transmission between said main lamp and said projection lens before failure of said main lamp, and a second position whereat said reflecting means reflects light from the automatically energized spare lamp along the optical axis of said projection lens.

4,061,912

FILAMENT ALIGNMENT MECHANISM FOR FOLLOW SPOT OR THE LIKE

Craig Levasseur, Calabasas, Calif., assignor to Berkey-Colortran, Inc., Burbank, Calif.

Filed Oct. 26, 1976, Ser. No. 735,698
Int. Cl.² F21V *19/02*
U.S. Cl. 362—287 **6 Claims**

1. In a stage luminaire or the like:

a. a luminaire housing including a reflector housing section and a lamp housing section, said lamp housing section having a rear wall formed substantially as a spherical segment;

b. a reflector mounted in said reflector housing section and having a central access opening;

c. a lamp socket support located between said reflector and said rear wall of said lamp housing section;

d. a lamp socket carried by said support;

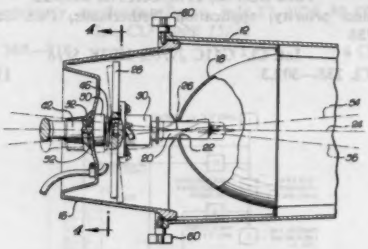
e. a manual actuating element located outside said rear wall and conforming to the external spherical configuration thereof;

f. a draw screw connection between said socket support and said manual actuating element, including a part projecting through a clearance hole in said rear wall;

g. spring means urging said support towards said reflector and frictionally urging said manual actuating element into engagement with said rear wall;

h. said socket support being supported only by the frictional engagement of said actuator with said wall section;

i. said rear wall having a center of curvature located forwardly of said wall and substantially at the central access



opening of said reflector whereby sliding movement of said actuator across said spherical wall sectional laterally positions a lamp supported by said lamp socket;

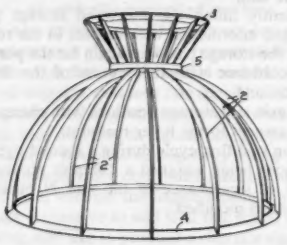
j. means limiting angular movement of said support in said housing whereby rotation of said actuator advances and retracts said lamp socket.

4,061,913

COLLAPSIBLE LAMP SHADE FRAME

Joseph D. Ross, 114 Angas Road, Westbourne Park, South Australia, Australia (5041)

Filed Dec. 11, 1975, Ser. No. 639,814
Claims priority, application Australia, Dec. 18, 1974, PC0050/74
Int. Cl.² F21V *1/06*
U.S. Cl. 362—357 **7 Claims**



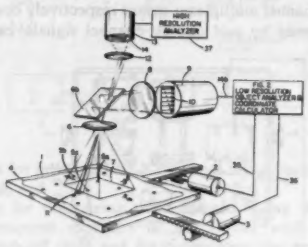
1. A lamp shade assembly comprising a series of ribs, and annular spacers for the said ribs, the said ribs being planar members shaped to stack together as a pack and being assemblable on the spacers to define an annular lamp shade shape, a main spacer to engage the ribs intermediate the ends thereof, and further spacers which are positioned to engage the ribs remotely from the main spacer on each side thereof, which spacers are themselves spaced apart by the said ribs, said spacers having interlocking configuration for the ribs at spaced intervals, said spacers and ribs being of a configuration whereby the ribs are held in interlock with the spacers by flexure of the materials from which at least the said ribs are formed.

4,061,914

METHOD AND APPARATUS FOR DUAL RESOLUTION ANALYSIS OF A SCENE

James Edmond Green, P.O. Box 734, Fayetteville, Tenn. 37334

Continuation-in-part of Ser. No. 526,896, Nov. 25, 1974, Pat. No. 3,970,841. This application May 4, 1976, Ser. No. 682,970
The portion of the term of this patent subsequent to July 20, 1993, has been disclaimed.
Int. Cl.² H01J 39/12; G01N 33/16
U.S. Cl. 250—201 18 Claims



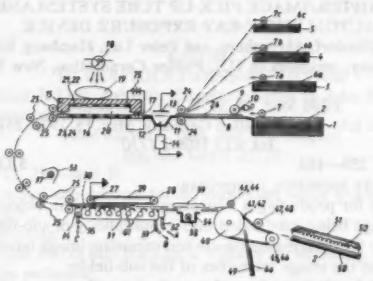
6. A dual resolution scanning apparatus comprising:
means for positioning a sample;
means for scanning a positioned sample at a low resolution, said low resolution scanning means having a low resolution field of view;
means for detecting when a sample object is encountered during the low resolution scan;
means for analyzing the detected sample object to determine if it is an object of interest;
means for scanning the object of interest at a higher resolution, said high resolution scanning means having a high resolution field of view;
means responsive to said object detection means for initiating the object scanning by said high resolution scanning means while said low resolution scanning means continues to scan the sample to detect any other objects in the sample without moving the sample relative to at least one of said resolution fields of view.

4,061,915

METHOD AND APPARATUS FOR MAKING X-RAY IMAGES

Josef Pfeifer, Unterhaching; Alfred Rheude, and Jürgen Müller, both of Munich, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 8, 1976, Ser. No. 693,912
Claims priority, application Germany, June 13, 1975, 2526415
Int. Cl.² G03G 15/00
U.S. Cl. 250—315 A 40 Claims



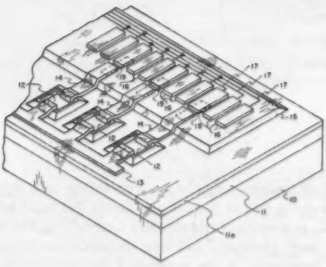
1. In a method of making X-ray images on sheet-like dielectric receptors which are exposed to object-modulated X-rays in the interelectrode gap of an ionography imaging chamber to produce thereon latent images which are made visible by xerographic techniques at a developing station, the steps of separably attaching each receptor to one side of a discrete sheet-like carrier which is at least partially conductive and extends beyond the respective receptor; and individually transporting the thus attached receptors in a predetermined direction toward, through and past said imaging chamber by way of the respective carriers.

4,061,916

SILICON-INSULATOR-POLYSILICON INFRARED IMAGING DEVICE AND METHOD OF MAKING SAME

Gerard J. King, Alexandria, and Joseph F. Martino, Jr., Falls Church, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 1, 1976, Ser. No. 737,369
Int. Cl.² H01J 31/49
U.S. Cl. 250—332 8 Claims



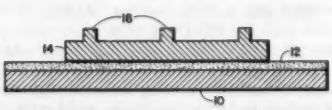
1. An imaging infrared detector device including a support substrate:
an insulating layer on one side of said substrate;
an array of infrared detectors on said insulating layer;
a CCD on said insulating layer including an array of unit cells at least equal in number to the number of detectors, each unit cell including a coupling region; and
electrical lead means including a common connector to one side of each of said detectors, individual connectors from an opposite side of each of said detectors to a respective CCD coupling region, and drive connectors for said CCD.

4,061,917

BOLOMETER

Rex W. Goranson, Star Rt. Box 14, Placitas, N. Mex. 87043, and Raymond V. Wick, 10421 Karen NE., Albuquerque, N. Mex. 87111

Filed May 24, 1976, Ser. No. 688,970
Int. Cl.² G01T 1/24
U.S. Cl. 250—338 9 Claims



1. A thin film bolometer for the detection of radiation and to provide X and Y positions of the input radiation relative to fixed coordinates and a measure of the radiation which comprises:
A film of heat conducting material;
A thin film of bismuth on said material;

At least a pair of contacts formed on said film of bismuth; and

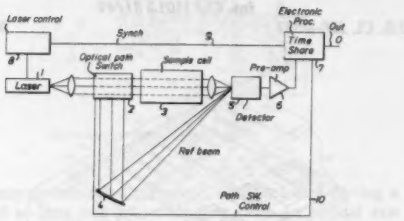
A circuit including a source of D.C. voltage connected to said contacts to generate signals as functions of incident radiation position and a further signal which is a function of radiation intensity.

4,061,918

MEASUREMENT OF LOW CONCENTRATION GASES

Horst Preier, Am Forsthaus Gravenbruch 33, 6078 Neu-Isenburg, and Wolfgang Riedel, Bergstr. 24, 6051 Waldacker, both of Germany

Filed Aug. 11, 1975, Ser. No. 603,701
Claims priority, application Germany, Sept. 8, 1974, 2438294
Int. Cl.² G01J 3/42
U.S. Cl. 250—343 **11 Claims**



1. Method of determining the concentration of a particular, infrared absorbing gas in a host gas under pressure and contained therein at a small concentration comprising the steps of:

providing laser generated infrared radiation including varying the frequency of the generated narrow-banded radiation to obtain at least two different and distinct laser frequencies but with in the range of a pressure widened band of an infrared absorption line;

detecting, sampling and holding sequentially and separately for each of said frequencies, the intensity of the emitted radiation as provided; detecting, sampling and holding sequentially and separately for each of said frequencies the intensity of the radiation as provided after said latter radiation has traversed a path that contains said host gas and the particular gas;

forming signal representations of the quotients of said intensities as measured pursuant to said measuring steps and separately for each said frequencies, said quotients each being the relative transmission for each of said frequencies; and

processing the signal representations electrically to obtain a representation of the concentration of the particular gas in the host gas.

4,061,919

GAMMA CAMERA SYSTEM

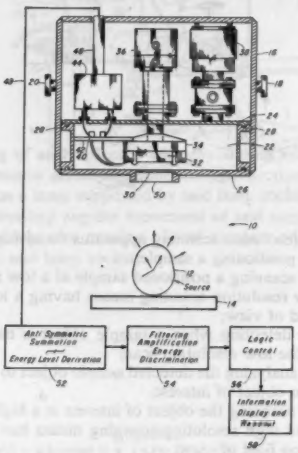
Don W. Miller, Westerville, and Mark S. Gerber, Columbus, both of Ohio, assignors to The Ohio State University, Columbus, Ohio

Filed July 6, 1976, Ser. No. 702,981
Int. Cl.² G01T 1/20
U.S. Cl. 250—363 S **41 Claims**

1. In a system for imaging the distribution within a region of interest of isotopic materials emitting radiation of given photon energy, said system including composite solid state detector means having a plurality of discrete components which are operationally associated to provide spatial coordinate parameter outputs representative of the spatial disposition of corresponding interactions of said radiation with said detector means, the improvement comprising:

first output treating means connected to receive said spatial coordinate parameter outputs of said detector means components, actuable to selectively filter and sum said outputs to derive corresponding coordinate channel signals and an energy channel signal having values corresponding respectively with said spatial disposition and given photon energy exhibited at a said interaction, said first output treating means further including control means for effecting said actuation to filter and sum and for deriving a data acceptance signal in correspondence with said coordinate and energy channel signals, said control means being responsive to a received reset signal to reset said first output means to a clear condition;

means including spatial coordinate multiplexer means and energy channel multiplexer means respectively coupled to be addressed by said energy channel signals, each said



multiplexer means being responsive to a coded actuating signal to effect a transference of said channel signals addressed thereto;

process control means including memory means for receiving said data acceptance signals and selectively retaining them in received serialized fashion, and actuable to derive said coded actuating signal in correspondence with said serialized data acceptance signals;

sequential control means for selectively actuating said process control means and regulating an operational cycle of said system; and

second treating means responsive to said transferred channel signals for deriving readout information representative thereof.

4,061,920

X-RAY INSTALLATION COMPRISING AN IMAGE INTENSIFIER/IMAGE PICK-UP TUBE SYSTEM AND AN AUTOMATIC X-RAY EXPOSURE DEVICE

Ralf Möllendorf, Ahrensburg, and Peter Lux, Hamburg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 15, 1976, Ser. No. 666,652
Claims priority, application Germany, Mar. 15, 1975, 2511523
Int. Cl.² H05G 1/30
U.S. Cl. 250—413 **5 Claims**

1. X-ray apparatus, comprising:

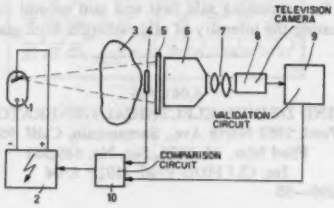
means for producing a fluoroscopy image of an object, the image being subdivided into a multiplicity of sub-fields;

means for deriving maximum and minimum image intensities from the image intensities of the sub-fields;

means for deriving from the maximum and minimum image intensities an intermediate image intensity dependent upon the type of X-ray exposure subsequently desired of the object;

means for deriving a mean image intensity in sub-fields constituting a central measuring field;

means for deriving a switch-off dose by comparing the mean image intensity with the intermediate image intensity and adding the difference to a fixed value independent of the type of X-ray exposure subsequently desired;



means for measuring an X-ray dose in the central measuring field; and

means for comparing the measured X-ray dose during a subsequent exposure of the object with the derived switch-off dose and for terminating the exposure when they are equal.

4,061,921

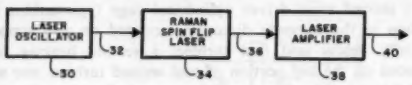
INFRARED LASER SYSTEM

Cyrus D. Cantrell, Santa Fe; Robert J. Carbone, and Ralph S. Cooper, both of Los Alamos, all of N. Mex., assignors to The United States of America as represented by the United States Energy Research & Development Administration, Washington, D.C.

Filed May 2, 1974, Ser. No. 466,583

Int. Cl.[2] H01S *27/00*; H01J *3/00*

U.S. Cl. 250—423 P **9 Claims**



9. A method for producing a high power laser beam for selective excitation of a desired isotope specie in a gaseous mixture of isotope species comprising generating an infrared laser beam at a first wavelength; shifting the first wavelength of said laser beam to a second wavelength; amplifying said second wavelength laser beam to said high power; irradiating said gaseous mixture with said high power laser beam to selectively excite said desired isotope specie; and shifting said second wavelength laser beam to a wavelength coincident with a vibrational state of said desired isotope specie separate from vibrational states of said other isotope species in said gas mixture.

4,061,922

ULTRAVIOLET SENSING DEVICE

Anthony J. Last, Aakville, Canada, assignor to John S. Ewald, Cuernavaco Morelos, Mexico

Filed May 17, 1976, Ser. No. 686,788

Int. Cl.[2] G01N *21/38*

U.S. Cl. 250—461 R **1 Claim**

1. A fail-safe control for an ultraviolet water purifier comprising:

a housing;

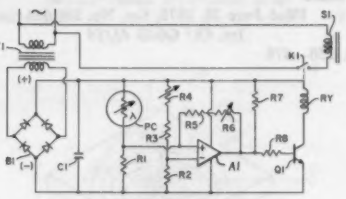
on one side of said housing, a window for admitting ultraviolet radiation;

on the side of said housing opposite said window, a fluorescent screen which emits visible light in response to ultraviolet irradiation;

a photoconductive cell responsive to visible light, said photoconductive cell being oriented within said housing to receive visible light emitted by said screen while being shielded from ultraviolet radiation entering through said window;

electromechanical means for controlling the flow of water through said purifier;

voltage divider means including said photoconducitve cell



for providing a voltage which varies in response to the illumination of said photoconductive cell;

voltage divider means for generating a reference voltage; and

electronic means interconnected with said divider means for controlling the electrical energization of said electromechanical means as a function of the relative values of said voltages.

4,061,923

RECEPTACLE FOR RADIOGRAPHIC FILM MATERIAL

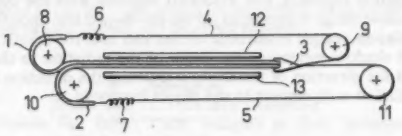
Lucas van der Does, Oenkerk, Netherlands, assignor to N.V. Optische Industrie "de Oude Delft", Delft, Netherlands

Filed Apr. 2, 1976, Ser. No. 673,093

Claims priority, application United Kingdom, Apr. 11, 1975, 14969/75

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—468 **3 Claims**



1. A radiographic film transport for X-ray equipment which comprises:

a first pair of parallelly-disposed rollers including a lead roller and a back roller;

a second pair of parallelly-disposed rollers including a lead roller and a back roller, said lead rollers of said first and second pair of rollers cooperating to form a nip therebetween;

a first fluorescent screen;

a second fluorescent screen;

a coupling member for linearly coupling one end of each of said first and second fluorescent screens;

a first connecting means connecting the other end of said first fluorescent screen to said coupling member for coursing said first fluorescent screen including first connecting means about said first pair of parallelly-disposed rollers;

a second connecting means connecting the other end of said second fluorescent screen to said coupling member for coursing said second fluorescent screen including second connecting means about said second pair of parallelly-disposed rollers;

motive means for moving said first and second fluorescent screens about said first and second pair of parallelly-disposed rollers to cause said coupling member to move between said lead rollers and said back rollers thereby to permit the introduction of film material between said fluorescent screens when said coupling member moves in

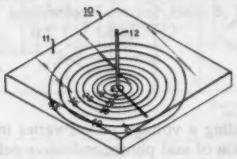
one direction and to deliver film material when said coupling member moves in an opposite direction.

4,061,924

UNIVERSAL ANGULOMETER

Marvin Jacoby, 166 Sherry Lake Apt., Conshohocken, Pa. 19428, and Guido A. La Porta, 6 Heather Drive, Marlton, N.J. 08053

Filed June 25, 1975, Ser. No. 590,051
Int. Cl.² G03B 41/16
U.S. Cl. 250—476 **7 Claims**



1. An angulometer for recording on radiation sensitive film at the time of exposure, both the direction of an incident radiation beam and the angle which the beam makes with the normal to the plane of the film, comprising in combination,

a. a flat planar radiation transparent plate;

b. a radiation opaque small diameter cylindrical rod fixedly mounted perpendicularly to the plane of said plate with its lower end extending through said plate and being coincident with the bottom surface of said plate, and

c. a set of concentric radiation opaque angulation indicator circles formed in the bottom surface of said plate, said circles having their common center coincident with the longitudinal central axis of said rod,

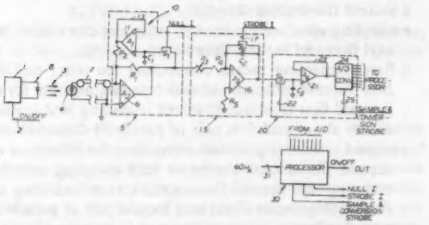
whereby, when the angulometer is placed on the radiation sensitive film adjacent to the object to be irradiated prior to radiation exposure, and irradiated together with the object, a shadow image is produced on the developed film showing the radiation opaque concentric circles and rod, the length of the rod shadow measuring the angle of the radiation to the rod, and the direction of the shadow showing the direction of the radiation with respect to the object irradiated.

4,061,925

METHOD AND APPARATUS FOR MEASURING RADIATION FROM A PLURALITY OF LIGHT SOURCES

Leonard C. van der Gaag, and Luciano Pacheco, both of San Jose, Calif., assignors to Versatile Integrated Modules, Santa Clara, Calif.

Filed Feb. 20, 1976, Ser. No. 659,591
Int. Cl.² H01L 9/00; H05B 33/00; G01N 21/58
U.S. Cl. 250—553 **19 Claims**



1. An apparatus for measuring the intensity of radiation from a source of radiation in the presence of ambient radiation having a periodic component comprising:

means for generating a first plurality of discrete signals, each of said signals having a magnitude protional to the intensity of said periodic component at a different predetermined time in a cycle of said component in the absence of radiation from said source and a second plurality of corresponding discrete signals, each of said second plurality of signals having a magnitude proportional to the combined intensity of said periodic component and radiation from said source at the same times in a subsequent cycle of said periodic component; and

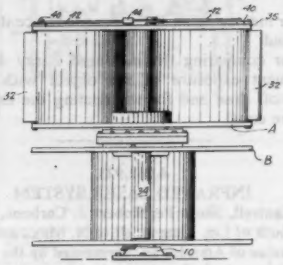
means for processing said first and said second signals for indicating the intensity of said radiation from said source.

4,061,926

WIND DRIVEN ELECTRICAL GENERATOR

Paul V. Peed, 1053 North Ave., Sacramento, Calif. 95838

Filed Mar. 24, 1976, Ser. No. 669,961
Int. Cl.² F03D 9/00; H02P 9/04
U.S. Cl. 290—55 **2 Claims**



1. A wind driven electric generating device comprising a support, a first wind driven cylindrical cage type turbine for rotation in one direction mounted on said support, a first bearing race mounted on the bottom portion of said first turbine and a second wind driven cylindrical cage type turbine for rotation in the opposite direction mounted on said support coaxially below said first turbine, a second bearing race mounted on the top portion of said second turbine, one said wind driven turbine carrying the armature of an electric generator, the other said wind driven turbine carrying the stater of said electric generator, a disc disposed on said shaft between said two turbines, and ball bearings disposed between said first bearing race and said second race and caged in by said disc to provide synchronization of rotation of said two turbines.

4,061,927

TIMING SYSTEM FOR WATERING DEVICES

Gustav A. Link, 3710 Lomitas Drive, Los Angeles, Calif. 90032

Filed May 10, 1976, Ser. No. 684,762
Int. Cl.² H02J 3/14
U.S. Cl. 307—41 **10 Claims**

1. A timing system for a plurality of electrically controlled watering devices comprising,

means for producing repetitive pulses,

a plurality of normally disabled frequency control devices for controlling said means to produce pulses of different frequencies,

means for manually preconditioning said control devices for selected frequencies,

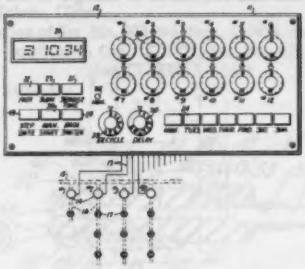
means for initiating operation of said pulse producing means,

a divide-by-N counter for counting said pulses and effective to produce an output signal upon registering N pulses from said pulse producing means,

an electronic switching device having a plurality of outputs for connection to respective ones of said watering devices,

said switching device comprising means controlled by said output signals for applying energizing signals successively

to different ones of said outputs whereby to energize respective ones of said watering devices; and



means responsive to said energizing signals for successively enabling different ones of said frequency control devices to control said pulse producing means.

4,061,928

CIRCUIT ARRANGEMENT FOR THE PROTECTION OF INPUTS OF INTEGRATED MOS CIRCUITS

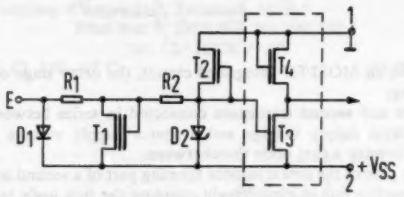
Heinrich Hubert Kessler, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 25, 1976, Ser. No. 717,704

Claims priority, application Germany, Sept. 8, 1975, 2539890

Int. Cl.² H02H *9/04*; H03K *3/353*

U.S. Cl. 307—200 B **2 Claims**



1. A protection circuit for protecting an input of an integrated MOS circuit against excessive voltages, the integrated MOS circuit connected across first and second supply terminals, comprising:

an input;

a pn bypass diode connected between said input and the first supply terminal;

a first MOS transistor including a source-drain path connected between the second supply terminal and an input of said MOS circuit and a gate connected to said input of said MOS circuit;

a gate controlled pn diode connected between said input of said MOS circuit and the first supply terminal;

a first resistor connected with a first terminal to said input of said MOS circuit;

a second MOS transistor including a source-drain path connected between a second terminal of said first resistor and said first supply terminal and a gate connected to said second terminal of said first resistor; and

a second resistor connected between said second terminal of said first resistor and said input.

4,061,929

CIRCUIT FOR OBTAINING DC VOLTAGE HIGHER THAN POWER SOURCE VOLTAGE

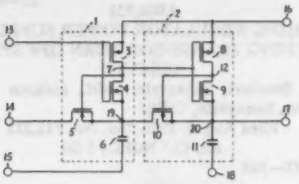
Kazuhiro Asano, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Sept. 21, 1976, Ser. No. 725,265

Claims priority, application Japan, Sept. 22, 1975, 50-114548; Sept. 23, 1975, 50-115210

Int. Cl.² H03K *1/14*; G04C *3/00*

U.S. Cl. 307—246 **7 Claims**



1. A voltage boosting circuit comprising a plurality of boosting units connected in series, each of said units comprising a condenser and an MOS-FET, said MOS-FET of a first unit being connected between one terminal of said condenser and one terminal of a power source so as to connect said terminal with said power source when said MOS-FET is conductive and said MOS-FET of a succeeding unit being connected between said terminal of said condenser of the preceeding unit and one terminal of said condenser of said succeeding unit so as to connect said terminals of said condenser when said MOS-FET is conductive, and means for switching said MOS-FET, said switching means of each said unit comprising a second MOS-FET having a source connected to the opposite terminal of said power source, a third MOS-FET having a source connected to the source of said first mentioned MOS-FET and to one terminal of said condenser, means connecting the drains of said second and third MOS-FETs to the gate of said first mentioned MOS-FET and means for applying a pulse signal to the gates of said second and third MOS-FETs.

4,061,930

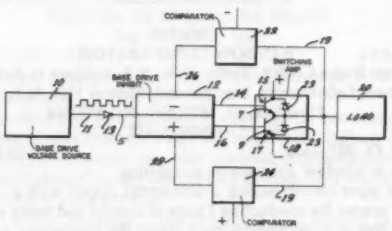
BASE DRIVE INHIBIT CIRCUIT

Arne Nerem, San Diego, Calif., assignor to Rohr Industries, Incorporated, Chula Vista, Calif.

Filed June 11, 1976, Ser. No. 695,014

Int. Cl.² H03K *17/60*

U.S. Cl. 307—254 **4 Claims**



1. A base drive inhibit circuit for positive and negative phase transistors of a switching amplifier comprising:

a source of base drive voltage having alternate positive and negative states;

a first means for producing a first signal responsive to the conduction state of said positive phase transistor and a positive phase reference voltage level;

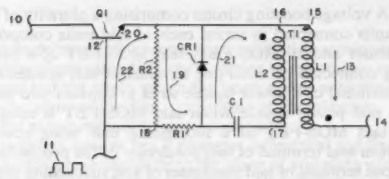
a second means for producing a second signal responsive to the conduction state of said negative phase transistors and a negative phase reference voltage level; and

a control means for selectively supplying said base drive voltage from said source to said positive phase transistor when said first signal indicates that said positive transistor is in a forward biased state with respect to said positive reference voltage level and said base drive voltage is in a positive state and to said negative phase transistor when said second signal indicates that said negative transistor is in a forward biased state with respect to said negative reference voltage level and said base drive voltage is in a negative state.

4,061,931
SWITCHING REGULATOR POWER SUPPLY MAIN SWITCHING TRANSISTOR TURN OFF SPEED UP CIRCUIT

Robert J. Boschert, Sunnyvale, Calif., assignor to Boschert Associates, Sunnyvale, Calif.

Filed Aug. 6, 1976, Ser. No. 712,222
Int. Cl.² H03K 17/00
U.S. Cl. 307—300 **3 Claims**



1. In a switching regulator power supply, a main switching transistor turnoff speedup circuit comprising:

a transformer having a primary and a secondary winding, said primary winding connected in series between the output electrode of the main switching transistor and the output terminal of the power supply, the first end of said secondary winding connected to said output electrode, said secondary winding being wound to produce signals at its second end that are oppositely phased from corresponding signals at said output terminal of said power supply;

signal feedback circuitry including a capacitor coupled in series between said second end of said secondary winding and the base of said switching transistor for applying said oppositely phased signals to said base; and

signal bypass means coupled across said secondary winding for suppressing forward bias enabling signals from the base of said transistor and for applying negative biased regenerative turnoff signals to said base.

4,061,932
WINDOW COMPARATOR

Robert Roger Cordell, Tinton Falls, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 17, 1976, Ser. No. 658,744
Int. Cl.² H03K 5/153, 5/20
U.S. Cl. 307—360 **15 Claims**

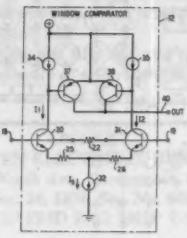
1. A window comparator comprising

an input circuit having a differential circuit with a current source for conducting I units of current and being responsive to a differential input signal for conducting two dependently variable currents through different output sides to an output circuit, the input circuit being arranged for rejecting common-mode input signals,

the output circuit having a pair of current source loads, each load arranged for conducting a fixed magnitude of current greater than I/2 units of current and connected to a different side of the output of the input circuit, the output circuit being responsive to either side of the input circuit conducting more than the predetermined magnitude of current,

a pair of voltage dropping elements connected to the current source in the input circuit for establishing two limits of the window comparator, and

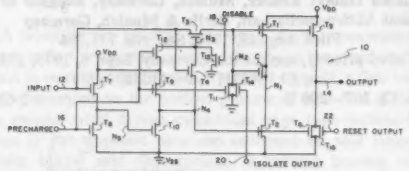
the output circuit connected with the different sides of the input circuit and responsive to changes in the ratio between the two dependently variable currents conducted therethrough for indicating with a single uniform signal when the magnitude of the differential input signal exceeds one of the two limits.



4,061,933
CLOCK GENERATOR AND DELAY STAGE

Paul R. Schroeder, Dallas, and Robert J. Proebsting, Richardson, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Dec. 29, 1975, Ser. No. 644,855
Int. Cl.² H03K 5/13, 1/12, 19/08
U.S. Cl. 307—262 **27 Claims**



1. In an MOSFET integrated circuit, the delay stage comprising;

first and second transistors connected in series between a drain supply voltage and a source supply voltage and forming a first node therebetween,

the gate of the first transistor forming part of a second node,

capacitor means capacitively coupling the first node to the second node,

an input node,

a third transistor having a channel connecting the second node to the input node,

the gate of the third transistor forming part of a third node,

the gate of the second transistor forming part of a fourth node, and

precharge circuit means for precharging the third and fourth nodes to turn the third and second transistors, respectively, on, and for discharging the second node to turn the first transistor off, and

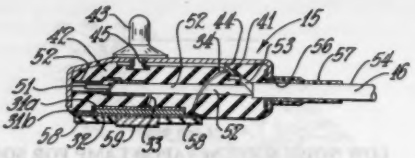
control circuit means for holding the voltage charge on the third node as the input node transitions from a voltage near the source supply voltage to a voltage nearer the drain supply voltage to allow the third node to be capacitively boosted and thus rapidly charge the second node substantially to the voltage at the input node and for automatically discharging the third and fourth nodes a short delay period after the rise of the voltage on the input node to turn the second and third transistors off whereby the rise in voltage on the first node will capacitively boost the voltage on the second node as a result of the capacitor means.

4,061,934

VIBRATION PICKUP UNIT FOR SENSING VIBRATIONS OF MUSICAL INSTRUMENTS AND THE LIKE

Horace N. Rowe, Swanton, Ohio, assignor to Rowe-DeArmond, Inc., Toledo, Ohio

Continuation of Ser. No. 503,964, Sept. 6, 1974, abandoned. This application Oct. 14, 1975, Ser. No. 622,404
Int. Cl.[2] H01L 41/04
U.S. Cl. 310—323 1 Claim



1. A pickup unit for translation of mechanical vibrations such as of musical instruments and the like into electrical signals of corresponding frequency comprising;

a casing for said pickup unit having at least one open wall,

a vibratable diaphragm,

a flex type piezoelectric element bonded to the surface of said diaphragm,

means resiliently supporting said diaphragm and piezoelectric element at the open wall of said casing with said piezoelectric element disposed on the interior casing side thereof,

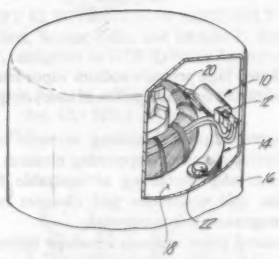
a vibration transmitting means comprising a layer of cork secured to said diaphragm and securing means on each side of said vibration transmitting means comprising resilient foam material having an adhesive surface.

4,061,935

OVERLOAD PROTECTOR MOUNTING APPARATUS

Tara Kandpal, Tecumseh, Mich., assignor to Tecumseh Products Company (Compressor), Tecumseh, Mich.

Filed Jan. 5, 1976, Ser. No. 646,523
Int. Cl.[2] H02K 11/00
U.S. Cl. 310—68 C 13 Claims



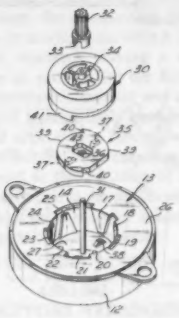
1. The combination comprising a compressor motor, a thermal overload protector adapted for electrical connection to said motor and means mounting said protector in thermal proximity to said motor, said means comprising a bracket mounted on a surface of said motor and including a raised platform spaced in assembly from said motor surface, said platform having a hole formed centrally therein, and a hollow protector holder having an opening to receive said protection means and a resilient outer wall, said holder further having a stud and a pair of spaced longitudinally extending ribs formed on said wall, said ribs having respective opposed longitudinally extending grooves formed therein, said holder being slidably received onto said platform with corresponding edges of said platform being received by resilient snap-fit into said hold, said holder being specifically contoured to internally receive and retain said protector.

4,061,936

SYNCHRONOUS MOTOR

Lee A. Woolley, Kokomo, Ind., assignor to The Scott & Fetzer Co., Kokomo, Ind.

Filed Apr. 26, 1976, Ser. No. 680,532
Int. Cl.[2] H02K 7/118
U.S. Cl. 310—41 5 Claims



1. A synchronous motor comprising an annular stator having a cylindrical inner periphery, a cylindrical rotor mounted within and spaced from an inner cylindrical periphery of the stator, said rotor having a plurality of rotor poles spaced about its cylindrical periphery, said stator having a plurality of stator poles spaced about its inner periphery, one of said pluralities having axially tapered poles with one of said tapered poles being angularly and circumferentially offset from the remaining poles of said one of said pluralities, said remaining poles being equally spaced from each other about an arc which does not include the offset pole.

4,061,937

METHOD AND APPARATUS FOR FABRICATING VENT PLATE HAVING BOW-TIE SLOT ARRANGEMENT

Rajeshwar P. Goel, Monroeville; Terry L. Vota, Elizabeth, and Thomas J. Lynch, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1976, Ser. No. 661,076
Int. Cl.[2] H02K 1/20
U.S. Cl. 310—65 3 Claims

1. A plate for supporting a finger having a rivet portion, said plate comprising:

a punching having a plurality of openings for receiving the rivet portions, each of said openings being defined by a plurality of intersecting side portions symmetrically disposed about first and second lines of symmetry which are mutually perpendicular;

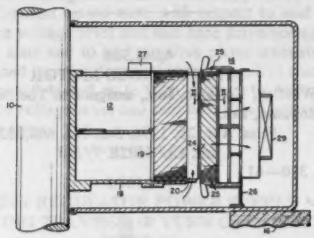
each of said openings being elongated with respect to the first line of symmetry;

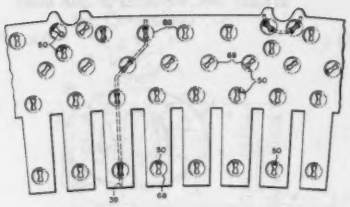
the elongated side portions of said openings each comprising a pair of planar surfaces which intersect along the second line of symmetry;

each of said openings including first and second curved side portions disposed intermediate the elongated intersecting side portions, said curved side portions being concave with respect to the second line of symmetry;

the length of said openings as measured through the point of intersection of said lines of symmetry from the surface of the first concave side portion to the surface of the second

concave side portion being substantially equal to the length of the rivet portion, and the width of said openings





as measured along the second line of symmetry being substantially equal to the width of the rivet portion.

4,061,938

DEVICE FOR GENERATING ELECTRICAL PULSES IN RESPONSE TO SHAFT ROTATION

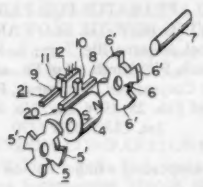
Kiyoshi Hashimoto, and Shigeki Kitamura, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 16, 1976, Ser. No. 696,853

Claims priority, application Japan, June 20, 1975, 50-76120; Aug. 11, 1975, 50-97288; Nov. 28, 1975, 50-143128

Int. Cl.² H02K *21/12*

U.S. Cl. 310—168 **27 Claims**



1. A device for generating electrical pulses each time a shaft turns a revolution, which device comprises:

a magnet having a longitudinal axis and axially magnetized, and secured to said shaft in such a manner as to be revolvable about the axis;

two yokes, each made of magnetic material and having a plurality of blades, said two yokes being fixedly attached to opposite axial ends of said magnet, respectively, and arranged such that each of the blades of one of said two yokes axially faces a space between two blades of the other yoke;

means for coupling an alternating magnetic field between said yokes in an axial direction with revolution of said magnet, which means is provided in the magnetic field between said yokes and includes two rod-like members, said two rod-like members being arranged in parallel to each other and positioned in parallel to said axis and in the vicinity of said yokes such that, when one of the two members faces one of the blades of one of said two yokes, the other member faces one of the blades of the other yoke; and

a magnetoelectric transducer magnetically coupled to said means in a manner as to be between the two rod-like members of said means for generating said electrical pulses due to said alternating magnetic field.

4,061,939

LOW NOISE SODIUM VAPOR LAMP FOR SONIC PULSE OPERATION

Jack M. Strok, Jr., Northfield, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 2, 1976, Ser. No. 710,486

Int. Cl.² H01J *61/068, 61/22, 61/36*

U.S. Cl. 313—25 **6 Claims**

1. A jacketed high pressure sodium vapor lamp for operation at low noise levels on sonic pulses of short duty cycle comprising:

an elongated light-transmitting ceramic arc tube having conductive electrode-supporting closures sealed to opposite ends and containing an ionizable filling including sodium, said electrodes and closures comprising only non-magnetostrictive material,

an evacuated outer vitreous envelope surrounding said arc tube, said envelope having a vitreous stem at one end including a press through which extend a pair of inleads, all portions of said inleads including an intermediate portion sealed through the press, an inner portion passing into the outer envelope, and an outer portion being of non-magnetostrictive metal,

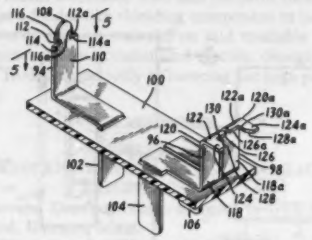
a metal wire frame within said envelope for supporting and making electrical connections to said arc tube, said frame comprising a long side rod extending from the inner portion of one inlead to the other end of said envelope, and a short rod extending from the inner portion of the other inlead, both said rods being of non-magnetostrictive metal,

and attachments between said arc tube closures and said rods.

4,061,940
BASELESS CARTRIDGE LAMP AND SOCKET THEREFOR

James J. Fitzgerald, Kinnelon; Joseph J. Fortunato, Livingston, and Nickolas P. Demas, Cranford, all of N.J., assignors to Wagner Electric Corporation, Parsippany, N.J.

Filed Mar. 31, 1976, Ser. No. 672,266
Int. Cl.[2] H01J 5/48, 5/50
U.S. Cl. 313—318 7 Claims

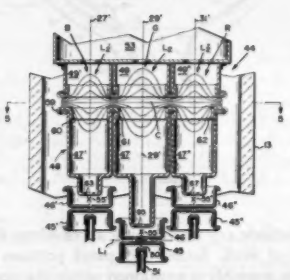


1. An electric lamp and cooperating socket therefor comprising:
   a. at least three conductive support members sealably embedded in a lamp envelope;
   b. each of said support members having an inside part and an outside part;
   c. said inside parts of said support members being connected to at least two electrical components;
   d. mounting means formed in said outside parts;
   e. socket means having at least three means for cooperative supporting and power supplying engagement with said at least three outside parts; each of said at least three means for cooperative supporting and power supplying engagement being electrically insulated from at least two others; and
   f. said mounting means containing installation limiting means cooperating with the supporting means on said socket to require installation on said socket means in a single rotational orientation.

4,061,941
CRT ELECTRON GUN ASSEMBLY

Joseph L. Hallett, Seneca Falls, and Donald L. Say, Waterloo, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 24, 1976, Ser. No. 699,440
Int. Cl.[2] H01J 29/50, 31/20
U.S. Cl. 313—414 1 Claim

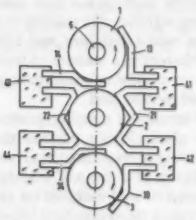


1. An improvement in a plural beam bi-potential in-line electron gun assembly embodying a center and two-side-related guns, said assembly including electron generating means formed to emit a plurality of separately controlled electron beams of substantially differing current levels when used in a color cathode ray tube having a forwardly oriented electron-responsive screen, each of said guns being formed of an arrangement of a plurality of related electrode members positioned in a spaced sequential manner forward of a rear-oriented cathode member to conjunctively effect control, initial acceleration, focusing and final acceleration of each beam, said improvement being structural dimensional differentiations in said gun assembly comprising:
   constructional differentiation of at least the center gun structure of said assembly wherein the beam current level associated therewith is greater than that of said side-related guns, the focusing electrode member of said center gun having a greater length and an output portion of a larger diameter than the comparable dimensions of said side-related guns in conjunction with a sequentially adjacent acceleration electrode having a substantially like aperture diameter to provide for the formation of a final focusing lens of increased diameter and reduced spherical aberration oriented interspatially between the respective focusing and final acceleration electrode members of said center gun, said structural differentiation providing operational improvement in the focusing of the high current center beam to a spot size at the screen substantially equalling the spot sizes of the associated beams emanating from the side-related guns of said assembly.

4,061,942
IN LINE GUN SUPPORT ARRANGEMENT WITH EXPANSION COMPENSATION

Wolfram Andre, Aichwald, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 9, 1976, Ser. No. 748,786
Claims priority, application Germany, Dec. 17, 1975, 2556862
Int. Cl.[2] H01J 29/02, 29/50
U.S. Cl. 313—417 1 Claim



1. An electron gun for a multibeam electron tube which generates three electron beams in one line, the center focused beam thereof extending in the longitudinal axis of said tube, comprising:
   four glass rods arranged around said longitudinal axis of said tube;
   three modulator electrodes;
   suspension elements connected to said four glass rods on one end portion thereof and contacting said electrodes on the other end, said center electrode for said center electron beam being held in position by two of said suspension elements each of which is affixed to two of said glass rods, said four glass rods being arranged in pairs on opposite sides of said modulator electrodes;
   means for connecting two suspension elements for each of said modulator electrodes for the outer beams each pair of suspension elements for each outer beam electrode having ends connected to glass rods on opposite sides of each said electrode, and opposite ends contacting opposite sides of each said electrode substantially tangentially whereby the forces caused by the longitudinal expansion caused by heating up of said electron gun substantially engage said outer modulator electrodes tangentially, and in the same

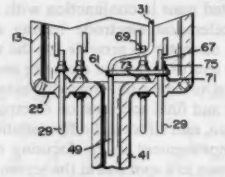
sense of rotation, to cause rotation of said outer electrodes around said axis of each associated beam.

4,061,943

CATHODE RAY TUBE WITH SUPPORTED CONDUCTOR EXTENDING THROUGH EXHAUST TUBULATION

Mario A. DiDominico, and Harry E. Smithgall, both of Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 16, 1976, Ser. No. 715,177
Int. Cl.² H01J *29/02, 5/46*
U.S. Cl. 313—482 **2 Claims**



1. An improvement in a cathode ray tube embodying a screen supporting envelopic enclosure wherein a multi-element electron gun assembly is electrically connected with and supported upon a circular array of metallic pins traversing a glass closure portion of said envelope having an axially located hermetically sealed exhaust tubulation therein, said improvement comprising:

a separate electrical conductive means having a proximal section attached to one of said elements, the proximal section of said conductor being spatially positioned to extend to said closure portion whereat a distal section of said conductor is extended into said tubulation, said conductor being significantly smaller in cross section than the diameter of said tubulation and integrated into the hermetic seal thereof in a manner to traverse said seal thereby providing an axially oriented external electrical connection for said device; and

an apertured insulative member positioned within said tube above the glass closure portion thereof, said insulative member having at least three apertures therein, two of said apertures being of a size and orientation to accommodate the placement of said member on two of said pins in said circular array, a third aperture being spaced therefrom to effect positive and insulative positioning of said conductor in said tubulation.

4,061,944

ELECTRON BEAM WINDOW STRUCTURE FOR BROAD AREA ELECTRON BEAM GENERATORS

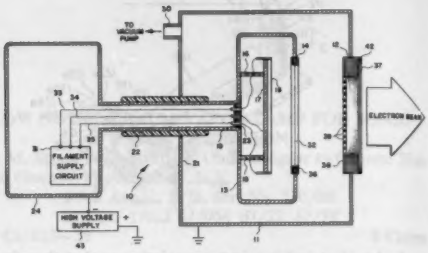
Gardiner Gay, Cambridge, Mass., assignor to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed June 25, 1975, Ser. No. 590,030
Int. Cl.² H01J *33/00*
U.S. Cl. 313—420 **6 Claims**

1. In an electron acceleration device for delivering to a region outside of the device an electron beam of substantial cross-section comprising a housing having an aperture, electron emission means within said housing and spaced from said aperture, an electron window adapted to be disposed within said aperture and defining with said housing an essentially gas-tight emission chamber, said electron window providing an exit from said housing through which said electron beam is transmitted when said housing is evacuated, said electron emission means actuated and an acceleration potential defining an electric acceleration field provided for accelerating electrons toward said electron window, the improvement which comprises:

a flat electrically conductive metal electron window support adapted to be sealably mounted in said housing aperture, said support having a high thermal conductance, a first surface for sealably receiving said electron window and a second surface facing said electron emission means;

said support having a plurality of elongated slots of a length and number to define the cross-section of said beam, said slots each being spaced apart a distance to define thin thermally conducting metal cross members each having an exposed end portion in contact with and supporting said window;



thermally and electrically conductive metal portions defining the bottom of each slot and comprising in part said second surface, each said metal portion having a plurality of closely spaced holes extending along the length of said slots and providing communication between the interior of said housing and said slots, said holes being of a size and spaced one from another to prevent the electric acceleration field from extending into said slots a substantial portion of the depth of said slots; and

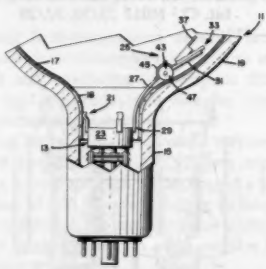
conduit means positioned in relation to said cross members through which fluid coolant can be passed in heat-exchange relationship with said cross members.

4,061,945

SHIELDED GETTER SUPPORT ON ROTOR-SUPPORTED ANTENNA

David Benda, Geneva, and Charles A. Davis, Auburn, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 3, 1976, Ser. No. 747,363
Int. Cl.² H01J *29/94;* **H01K** *1/52*
U.S. Cl. 313—481 **5 Claims**



1. In a cathode ray tube having an envelope formed of an integration of neck, funnel and panel portions wherein an electron gun assembly is positioned within the neck portion in a manner to beam electrons to impinge a cathodoluminescent screen disposed on the panel portion thereof, improved means for supporting a container of effusive material within substantially the funnel portion of the envelope comprising:

an antenna-type longitudinal positioning member having first and second ends, said first end being attached to said

electron gun assembly with the second end thereof having said container located thereat;

rod-like axle means attached to said longitudinal positioning member in a substantially transverse manner and substantially normal thereto at a region removed rearward from said second end thereof;

a rotatable member positioned in a freely turning manner on said axle means, said axle and rotatable member being fully oriented at a location rearward of the forward edge of said container; and

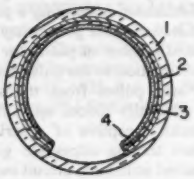
protective means associated with said rotatable member and formed as a fender-like shielding component to inhibit the deposition of effusive material on said rotatable member and to prevent any accumulated electric charge on said member from deleteriously influencing the scan pattern of the tube.

4,061,946

FLUORESCENT LAMP HAVING ZERO BACK BRIGHTNESS

Willy P. Schreurs, Danvers, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Oct. 6, 1975, Ser. No. 619,721
Int. Cl.² H01J 1/62
U.S. Cl. 313—488 **4 Claims**



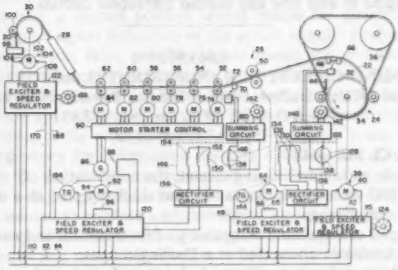
1. In a directional fluorescent lamp of the type comprising a tubular glass envelope having a reflector coating sandwiched between a phosphor layer and the glass envelope, the improvement which comprises a dark, nonreflecting, electrically nonconducting light-absorbing layer between the reflector coating and the glass envelope.

4,061,947

SPEED CONTROL SYSTEM FOR CONTINUOUS STRIP MANUFACTURING APPARATUS

Ralph A. Vogel, Three Rivers, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Aug. 4, 1976, Ser. No. 711,754
Int. Cl.² H02P 5/46, 5/00
U.S. Cl. 318—77 **4 Claims**



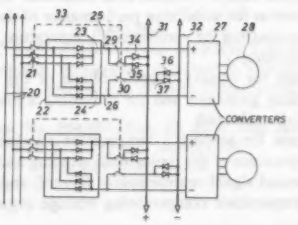
1. In a continuous strip manufacturing apparatus having first and second spaced rotary work means between which elongate material passes in the form of a loop, a first electric motor for driving said first work means, a variable-speed second electric motor for driving said second work means, manually operable control means for producing a first signal voltage proportional to a desired speed ratio of said second work means to said first work means, looper means for sensing the position of said loop of elongate material and producing a second signal voltage corresponding to the variation in position of said loop of elongate material from a preselected position, and regulator means having input means and output means controlling the speed of said second motor to vary the speed of said second motor in direct proportion to changes in a control voltage applied to said input means; the improvement comprising: summing means for producing a third signal voltage directly proportional to the sum of said first and second signal voltages, function generator means for adjusting the magnitude of said third signal voltage by a factor substantially linearly proportional to the rotational speed of said first work means to provide a fourth signal voltage, and circuit means for applying said fourth signal voltage as a control voltage to said input means of said regulator means to cause the speed of said second motor to vary substantially linearly with changes in the speed of said first work means and to further cause compensating variations in the speed of said second motor to maintain the position of said loop of elongate material within acceptable limits.

4,061,948

APPARATUS FOR RE-TRANSFERRING POWER FROM MECHANICALLY DRIVEN AND/OR ELECTRICALLY BRAKED MOTORS OF SPINNING MACHINES

Hansruedi Lamparter, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 12, 1975, Ser. No. 576,876
Claims priority, application Switzerland, May 20, 1974, 6874/74
Int. Cl.² H02P 7/70
U.S. Cl. 318—87 **10 Claims**



1. In combination,

a plurality of motors for a spinning machines,

an AC power supply line for supplying power to said motors,

a plurality of electrical circuits, each said circuit connecting at least one of said motors to said AC power supply line and including a rectifier connected to said power supply line, an intermediate DC circuit, and means for converting DC to AC, and

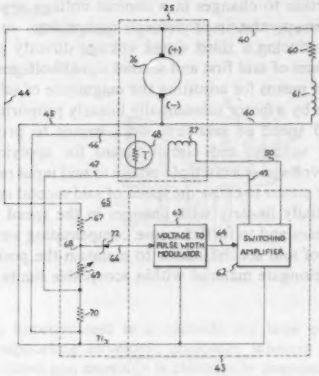
an apparatus for re-transferring power from at least one of said motors to another of said motors in response to mechanical driving and/or electrical braking of said one motor, said apparatus including a power equalizing circuit, and bi-directional coupling devices electrically connecting each intermediate DC circuit loosely to said power equalizing circuit.

4,061,949

EARTH EXCAVATOR INCLUDING APPARATUS FOR STABILIZING PERFORMANCE BY COMPENSATING FOR CHANGES IN TEMPERATURE

Daniel L. Griffis, Erie, Pa., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,556
Int. Cl.[2] H02P 5/26
U.S. Cl. 318—154 8 Claims



1. In an earth excavator of the type whose performance is subject to undesirable variations as a result of wide variations in temperature under which the excavator may be operated, the excavator including a movable earth excavating component and a direct current electric motor for providing motive power for the component, the electric motor having a field winding, the electrical resistance of the motor field winding being a direct function of the temperature of the motor field winding, thereby causing the performance of the motor and thus of the excavator to vary with variations in the current flowing through the motor field winding, and the excavator further including an exciting generator for supplying voltage and current to the motor field winding;

the improvement wherein said excavator further includes apparatus for stabilizing performance of the excavator by compensating for variations in temperature, said apparatus comprising:

a. means for sensing output voltage of the direct current exciting generator and for providing a first signal representative thereof;

b. means for sensing a temperature representative of the temperature of the motor field winding and for providing a second signal representative thereof; and

c. a temperature compensating voltage regulator comprising:

i. first input means for receiving the first representative signal;

ii. second input means for receiving the second representative signal;

iii. means for combining the first and second signals to produce a third signal as an inverse function of the first signal and a direct function of the second signal; and

iv. output means for supplying excitation current to a field winding of the exciting generator in response to the third signal;

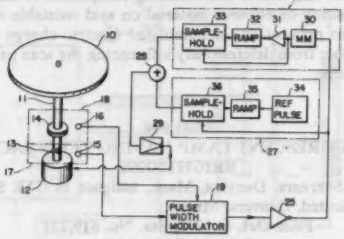
whereby the magnitude of regulated voltage supplied by the exciting generator to the motor field winding is directly related to the temperature of the motor field winding, thereby maintaining current supplied to the motor field winding and therefore the performance of the excavator substantially constant despite variations in the temperature of the said motor field winding.

4,061,950

PULSE GENERATING DEVICE FOR REGULATING THE ROTATIONAL SPEED OF A BODY

Kanji Kayanuma, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Aug. 12, 1975, Ser. No. 603,852
Claims priority, application Japan, Aug. 13, 1974, 49-91953; Aug. 13, 1974, 49-91954; Aug. 13, 1974, 49-91955
Int. Cl.[2] H02P 5/00
U.S. Cl. 318—314 11 Claims



6. In an apparatus for regulating the speed and phase of a rotating body, including means for driving said body, a first pulse generating mechanism generating a pulse for each rotation of said body, a second pulse generating mechanism generating a predetermined number of pulses for each said rotation with a constant time relation to the pulse from said first generating mechanism, said pulses from the second generating mechanism being unequally spaced apart from each other, a first utilization circuit receptive of a series of pulses with equally spaced-apart trailing edges for generating a speed control signal, a second utilization circuit including a source of a reference phase and receptive of said series of pulses for generating a phase control signal, and a summing circuit for combining said speed and phase control signals, said combined signals being coupled to said drive means to control the speed of rotation of said body at a constant value and the phase of said body at a constant relation with respect to said reference phase, the combination comprising, a shift register having a row of storage elements equal in number to the pulses from said second generating mechanism produced for each said rotation and receptive of the pulse from said first generating mechanism as a binary digit to be shifted through said storage elements and further receptive of the pulses from said second generating mechanism as a clock signal to shift said binary digit, and a plurality of monostable multivibrators each being receptive of the output from each said storage element and having manually adjustable time constant values to permit correction of the duration of the pulses from said second generating mechanism to provide a series of pulses with equally spaced-apart trailing edges at a given speed of rotation to serve as inputs to said first and second utilization circuits.

4,061,951

TIMING CIRCUIT FOR INCREMENTAL ACTUATORS

Alfred William Barber, 50-16 232nd St., Bayside, N.Y. 11364

Filed Oct. 20, 1975, Ser. No. 623,821
Int. Cl.[2] H02P 5/10
U.S. Cl. 318—443 1 Claim

1. In an interval timing circuit, the combination of;

a DC motor including an output shaft coupled to a utilization means;

a pair of transistors comprising a first transistor and a second transistor connected as a Darlington pair;

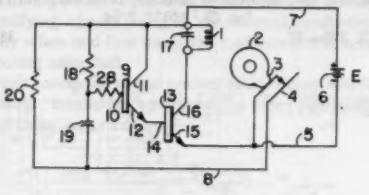
a battery for operating said circuit including said motor;

a series circuit consisting of said battery, the input to said motor and the collector to emitter path of the output transistor of said Darlington pair;

two resistors connected with one each of their terminals

connected to one pole of said battery and the other terminals of each resistor connected to opposite ends of a capacitor;

a single pole single throw switch coupled to the shaft of said motor and adapted to close once for each revolution of said shaft;



means connecting said switch between one end of said capacitor and the emitter of said second transistor of said Darlington pair;

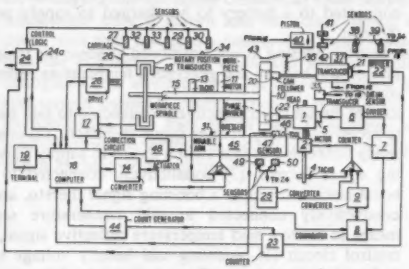
and means connecting the other end of said capacitor to the base of the first transistor of said Darlington pair.

4,061,952

COMPUTER-CONTROLLED MACHINE TOOL

Jack Dinsdale, Olney; David Wallace McQue, Milton Keynes, and Geoffrey Vorley, Sheppey, all of England, assignors to Cranfield Institute of Technology, England

Filed Apr. 14, 1975, Ser. No. 568,056
Int. Cl.[2] G05B *19/24*
U.S. Cl. 318—572 **12 Claims**



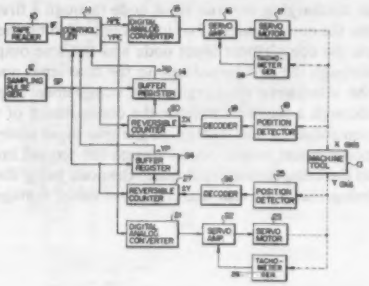
1. A control system for controlling the position of a rotating tool acting on a workpiece to form a non-circular profile on the workpiece, the system comprising: first motor means for adjusting the position of the tool; first position sensor means for providing a first digital signal representing the actual position of the tool; a second positive sensor means for providing a third digital signal indicative of the actual angular position of the workpiece; third position sensor means for providing a fourth digital signal representative of the position of a follower engaging the machined surface of the workpiece at a position angularly spaced from the tool in relation to the axis of angular movement of the workpiece; and digital computer means having a memory for information defining a desired non-circular profile for the workpiece, the second and third position sensor means being coupled to feed the computer means which is programmed to produce a second digital signal, indicative of a desired position for the tool, in dependence upon a selected portion of said stored information, which portion is selected by use of the third signal to compensate for tool wear; and comparator means responsive to any difference between the values represented by the first digital signal and the second digital signal indicative of a desired position for the tool for controlling the first motor means so as to reduce the difference.

4,061,953

NUMERICAL CONTROL SYSTEM

Mitsuo Matsumoto, Kokubunji, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed June 3, 1976, Ser. No. 692,347
Int. Cl.[2] G05B *19/24*
U.S. Cl. 318—573 **11 Claims**



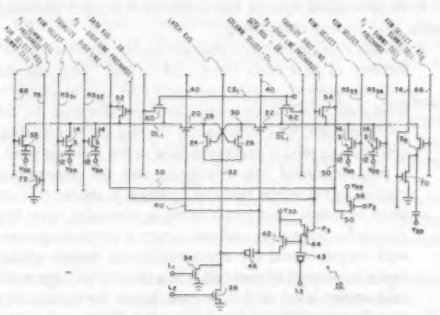
1. A numerical control system comprising a plurality of axially movable sections; a numerical data source for instructing a predetermined movement path of the movable section; a sampling pulse generator for generating a sampling pulse for every predetermined time period; position detecting means for detecting the amount and direction of movement of the movable section for the predetermined time period to generate a position data; a controller adapted to calculate an instruction position increment value of the movable section to be moved for the predetermined time period based on said numerical data and said sampling pulse from said sampling pulse generator, a position error memory section in the controller in which each calculated increment value is cumulatively added and each output from said position means is cumulatively subtracted; converter means for converting the numerical data from said position error memory section to an analog data; amplifier means for amplifying said analog data from said converter means; and a servo motor driven according to the output of said amplifier means.

4,061,954

DYNAMIC RANDOM ACCESS MEMORY SYSTEM

Robert J. Proebsting, Richardson, and Paul R. Schroeder, Dallas, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Division of Ser. No. 644,857, Dec. 29, 1975. This application Nov. 8, 1976, Ser. No. 741,720
Int. Cl.[2] G11C *11/24*
U.S. Cl. 320—1 **1 Claim**



1. The method for producing binary logic levels on true and

complement output nodes having relatively large capacitance values which comprises:

establishing a voltage level on both the true and complement output nodes near the higher logic level, the difference in voltage levels on the output nodes representing an input signal, and transferring the voltage levels through first and second impedances to true and complement input nodes, respectively, having relatively small capacitance values;

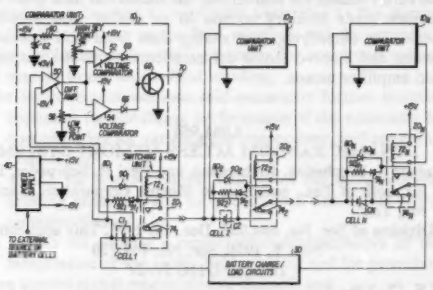
then discharging the true input node through a first transistor the conductance of which is controlled by the voltage on the complement input node and the true output node through the first impedance to the true input node, or in the alternative discharging the complement input node through a second transistor the conductance of which is controlled by the voltage on the true input node and the complement output node through the second impedance to the complement input node, the node being discharged being that node that had the lower initial voltage value.

4,061,955

MULTI-CELL BATTERY PROTECTION SYSTEM

Ralph D. Thomas, Cleveland, and Nagle, William J., Avon Lake, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 19, 1976, Ser. No. 687,822
Int. Cl. H02J 7/04
U.S. Cl. 320—6 **8 Claims**



1. A protection system for a battery having a plurality of cells, said system comprising:

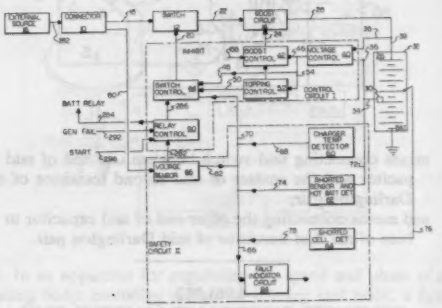
a plurality of protective circuits equal in number to the number of said cells, each said circuit being associated with an individual cell and each said circuit comprising solid state comparator means, connected across the corresponding cell, for continuously sensing and comparing the cell voltage with a predetermined upper voltage level and a predetermined lower voltage and for generating an output signal when said cell voltage is above said upper level or below said lower level, a normally open bypass circuit for bypassing said cell, control means responsive to said output signal for completing said bypass circuit to cause bypassing of said cell when the cell voltage is above said upper level or below said lower level, said bypass circuit comprising oppositely poled diodes connected in parallel and a resistor connected in series with one of said diodes.

4,061,956

ELECTRONIC DC BATTERY CHARGER

Lowell K. Brown, Midvale; William Albert Newman, and William A. Boyd, both of Salt Lake City, all of Utah, assignors to Utah Research and Development Company, Salt Lake City, Utah

Continuation-in-part of Ser. No. 629,285, Nov. 6, 1975, Pat. No. 4,016,473. This application Aug. 23, 1976, Ser. No. 716,524
Int. Cl.² H02J 7/04
U.S. Cl. 320—22 **31 Claims**



1. A battery charger comprising:

power connector means for removable conductive connection to an external source of direct current power;

switch means conductively connected to said power connector means to receive power therefrom;

a boost circuit conductively connected to said switch means to receive power therefrom and removably conductively connected to a battery to be charged to supply power thereto;

temperature sensing means positioned to sense the temperature of said battery and generate a temperature reflective signal;

a control circuit (1) conductively connected to said battery to receive a battery voltage signal therefrom, (2) conductively connected to said switch means to supply a switching signal thereto, (3) conductively connected to said boost circuit to supply a boosting signal thereto, and (4) conductively connected to said temperature sensing means to receive said temperature reflective signal, said control circuit (1) receiving said battery voltage signal and said temperature reflective signal to determine the temperature adjusted stage of charge of said battery, (2) supplying said switching signal to cause said switch means to supply power to said boost circuit in accordance with a preselected charging program related to said battery's state of charge, and (3) supplying said boosting signal to said boost circuit to cause said boost circuit to supply charging current signals to said battery which vary in magnitude and form in accordance with said preselected charging program related to said state of charge of said battery.

4,061,957

ELECTRIC ENERGY CONVERSION APPARATUS

Reinout Jan Vader, Verl. Frederikstraat 19, Groningen, Netherlands

Filed Feb. 4, 1976, Ser. No. 655,083
Int. Cl.² H02M 3/335
U.S. Cl. 363—22 **41 Claims**

1. An electrical energy conversion apparatus comprising:

at least one converter comprising:

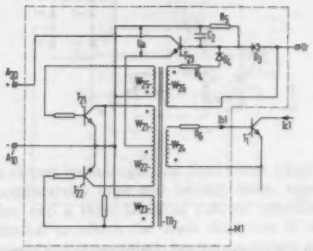
a transformer having a saturable core on which are wound a plurality of input windings including a tapped main input winding, and an output winding;

a high-power first transistor configuration connected to one end of said tapped main input winding of said transformer, said first transistor configuration having a control electrode; and

a low-power second transistor configuration connected to the other end of said main input winding and having a control electrode;

a rectifying circuit connected to said output winding, said rectifying circuit being in the current-conducting state only when said first transistor configuration is in the conducting state; and

a circuit connected to said control electrodes of said first and second transistor configurations for controlling the switching actions thereof;



whereby when a voltage is supplied to said energy conversion apparatus, said first and second transistors are alternately switched into the conducting state and said transformer core is magnetized in alternating directions, said control circuit being operative to switch said first transistor configuration out of the conducting state before said transformer core is driven into saturation during each cycle, said first transistor configuration being switched into the conducting state when said second transistor configuration is switched into the non-conducting state, said second transistor configuration being switched into its non-conducting state when said transformer core reaches saturation while said second transistor configuration is in the conducting state.

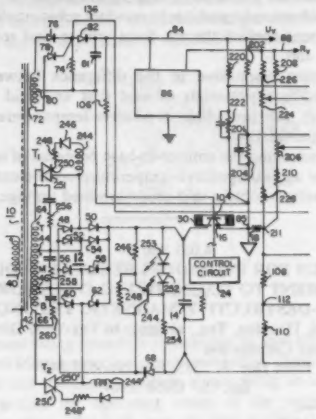
4,061,958

CONSTANT POWER RATING POWER SUPPLY

William T. Walker, Summit, N.J., assignor to Hewlett-Packard Co., Palo Alto, Calif.

Filed Apr. 14, 1976, Ser. No. 676,849
Int. Cl.² H02M 7/00
U.S. Cl. 363—81 **20 Claims**

1. Apparatus for providing selected levels of direct current voltage from a source of alternating current voltage comprising in combination a transformer having primary and secondary windings, a plurality of pairs of unilateral current conducting devices, the devices of each pair being connected in series with like polarity, means connecting said series pairs in parallel with like polarity, a direct current connection between a first intermediate tap on said secondary winding and a junction of a first of said pairs of said devices, a direct current connection between a econd intermediate tap on said secondary winding and the junction between a second pair of said devices, a first switch connected between a first point on said secondary winding that is on one side of said intermediate taps and the junction between a third pair of said devices, and a second switch connected between a second point on said sec-



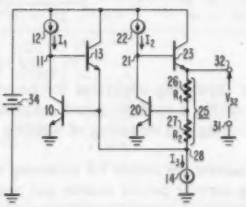
ondary winding that is on the other side of said intermediate taps and the junction between a fourth pair of said devices.

4,061,959

VOLTAGE STANDARD BASED ON SEMICONDUCTOR JUNCTION OFFSET POTENTIALS

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 5, 1976, Ser. No. 729,767
Int. Cl.² G05F 1/58
U.S. Cl. 323—1 **6 Claims**



1. A voltage standard for supplying predetermined voltage, said voltage standard comprising:

a first transistor having base and emitter electrodes and a base-emitter junction therebetween, having a collector electrode and being operated at an absolute temperature substantially equal to T;

a first source of current having no non-linear dependence upon the absolute temperature T;

means for applying the current from said first source of current between the emitter and collector electrodes of said first transistor;

a direct-coupled degenerative collector-to-base feedback connection of said first transistor for adjusting the emitter-to-base potential of said first transistor to condition said first transistor to conduct substantially all of said current applied thereto from said first source of current;

a second transistor having base and emitter electrodes with a base-emitter junction therebetween, having a collector electrode, and being operated at an absolute temperature substantially equal to T;

a second source of current for supplying a current proportional to that supplied by said first source of current;

means for applying the current from said second source of current between the emitter and collector electrodes of said second transistor;

a direct-coupled degenerative collector-to-base feedback connection of said second transistor for adjusting the emitter-to-base potential of said second transistor to condition said second transistor to conduct substantially all of said current applied thereto from said second source of current; and

scaling means responsive to the difference between the emitter-to-base potentials of said first and said second transistors for providing a positive-temperature-coefficient potentials; and

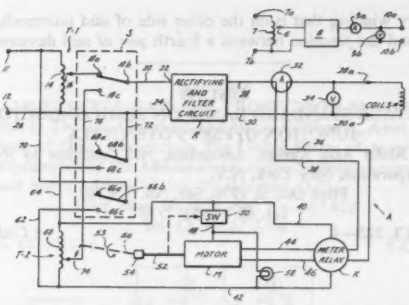
means for summing the emitter-to-base potential of said first transistor and said positive-temperature-coefficient potential, thereby to obtain said predetermined voltage.

4,061,960

APPARATUS FOR PROVIDING REGULATED DIRECT CURRENT TO MAGNETIZING COILS FOR NON-DESTRUCTIVE MAGNETIC TESTING

Donald Lloyd, Houston, Tex., assignor to Tex-Tube Division of Detroit Steel Corporation

Filed Dec. 8, 1975, Ser. No. 638,547
Int. Cl.[2] G05F 1/64
U.S. Cl. 323—9 **8 Claims**



1. A current regulating apparatus for providing regulated direct current within a predetermined range for non-destructive magnetic testing and detecting of welding defects in pipe, comprising:

a. variable transformer means for receiving current from an alternating current power source and providing varying output alternating current levels;

b. means for converting the alternating current output from said variable transformer means into direct current;

c. detecting means for detecting the magnitude of direct current from said means for converting, said detecting means including:

1. means for establishing a predetermined critical range of current magnitudes to a range of current magnitudes between lower and higher limits which are sufficiently low to maintain a high signal-to-noise ratio for detecting defects and sufficiently high to permit detection of welding defects in the pipe while the pipe is moving at variable speeds; and

2. control means for forming a control signal when the direct current magnitude is at either said lower or higher limit of the predetermined critical range of current magnitudes;

d. means responsive to the control signal formed by said control means for adjusting the direct current from said variable transformer means until the direct current magnitude is within the predetermined critical range to thereby regulate the direct current to the predetermined critical range; and

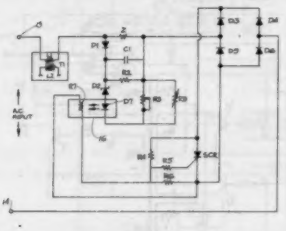
e. magnetizing coil means electrically connected to said converting means for receiving the regulated direct current therefrom to thereby form a magnetic field for non-destructive magnetic testing and detecting of welding defects in pipe.

4,061,961

CIRCUIT FOR CONTROLLING THE DUTY CYCLE OF AN ELECTROSTATIC PRECIPITATOR POWER SUPPLY

Forester C. Baker, Fort Thomas, Ky., assignor to United Air Specialists, Inc., Cincinnati, Ohio

Filed July 2, 1976, Ser. No. 702,188
Int. Cl.[2] B03C 3/68; G05F 1/44
U.S. Cl. 323—21 **2 Claims**



1. A circuit for controlling the duty cycle of a power supply of the type having a transformer and means connecting the secondary of said transformer to a two-stage electrostatic precipitator, said duty cycle being controlled in response to high level transients generated by arcing between components of said precipitator and reflected from the secondary of said transformer to the primary thereof, said circuit comprising:

a. switch means connected in series with the primary of said transformer and being controllable for allowing and inhibiting current flow therethrough, said switch means comprising the combination of a bridge rectifier and an SCR interconnected for passing both alternations of an A.C. signal applied across the primary of said transformer through said SCR in the same direction, said SCR having in association therewith a network for developing, from said A.C. signal, a gate voltage for maintaining said SCR in a conductive state;

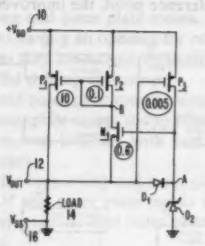
b. means in association with the primary of said transformer for developing an output signal reflecting the current through the primary of said transformer; and

c. sensing and control means for operating said switch means to inhibit said current flow in response to the generation of said high level transients substantially until the arcing condition associated therewith is supressed and to otherwise allow said current flow, said sensing and control means including isolating means having a light emitting element for electrically isolating said sensing and control means from said switch means, the combination of a capacitor and means for charging said capacitor connected in parallel with said output signal developing means for charging said capacitor to a level reflecting the current through the primary of said transformer, said means for charging being connected to prevent discharging said capacitor through said output signal developing means and said SCR and through the primary of said transformer, and the series combination of threshold means, resistor means and said light emitting element connected in parallel with said capacitor, said threshold means conducting only when said output signal exceeds a preset level to operate said switch to inhibit said current flow, said output signal being reset to a level less than said preset level after an interval following said inhibiting of said current flow for resuming said current flow upon the termination of said interval.

4,061,962
CURRENT MIRROR AMPLIFIER AUGMENTATION OF REGULATOR TRANSISTOR CURRENT FLOW

Roger Green Stewart, Neshanic Station, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 11, 1976, Ser. No. 695,189
Int. Cl.[2] G05F *1/56*
U.S. Cl. 323—22 R 9 Claims



9. In a circuit including a first field effect transistor being of a first conductivity type and having drain, source and gate electrodes; and a three-terminal current amplifier having an input terminal to which the drain electrode of said first field effect transistor is connected, having an output terminal from which an amplified and inverted current response to the drain current flow of said first field effect transistor is supplied to the source electrode of said first field effect transistor to augment its source current flow, and having a common terminal, the improvement wherein said current amplifier comprises:

second and third field effect transistors each being of a second conductivity type complementary to said first conductivity type, being of enhancement type, and having drain and source and gate electrodes, said second transistor having a scaling factor or width-to-length ratio that is relatively small compared to that of said first transistor, whereby said first and second transistors co-operate as a voltage amplifier with gain in excess of unity;

connections of the source electrodes of said second and third field transistors to the common terminal of said current amplifier;

connection of the input terminal of said current amplifier to the drain electrode of said second field effect transistor;

connection of the drain electrode of said third field effect transistor to the output terminal of said current amplifier; and

an interconnection between the base electrodes of the second and third field effect transistors to which the input terminal of said current amplifier is connected.

4,061,963
LOAD TAP CHANGER SYSTEM

John W. Green, New Wilmington, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 27, 1976, Ser. No. 680,632
Int. Cl.[2] H01F *29/04*
U.S. Cl. 323—43.5 R 7 Claims

1. A load tap changer system, comprising:

tap selector switching means having contact arms selectively movable between a plurality of electrical contacts, said plurality of electrical contacts being adapted for connection to taps on an electrical winding disposed to supply current to a load circuit,

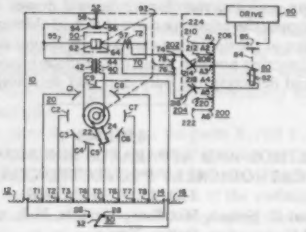
drive means for operating said tap selector switching means during a tap change cycle,

means for electrically isolating each contact arm prior to movement thereof by said drive means,

current transformer means disposed to measure current flow through the contact arm to be moved during a tap change cycle, prior to movement thereof by said drive means,

protective means responsive to said current transformer means for preventing said drive means from moving a contact arm which has current flowing therethrough,

means connected between said current transformer means and said protective means including a tapped transformer having switch means connected to said taps, said switch

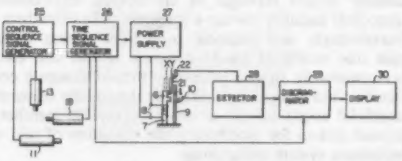


means being operated in response to said drive means for providing current to said protective means, when said current transformer means is providing an output, which is within the operating range of the protective means regardless of which taps on said electrical winding are connected in said load circuit.

4,061,964
ARMATURE OPERATION-RELEASE TESTING APPARATUS

Hitoshi Kubota, Yokohama, and Takashi Kobayashi, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Japan

Filed July 13, 1976, Ser. No. 704,963
Claims priority, application Japan, July 14, 1975, 50-85401
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—28 SE 1 Claim



1. An armature operating-release testing apparatus for testing the armature operating and releasing characteristics of an electromagnetic relay comprising an armature, a core and an electromagnetic coil, said apparatus comprising:

a. means for causing reciprocating movement of an externally controlled sensor between a stand-by position, at which said sensor is initially positioned opposite to and free from any electrical engagement with said armature of said electromagnetic relay disposed at a test position, and a detecting position at which said sensor is slightly displaced toward said armature beyond the armature attracting surface of said core;

b. power supply means adapted to be switched over for selectively supplying a predetermined operating current and a predetermined releasing current to said electromagnetic coil of said electromagnetic relay thereby causing movement of said armature toward and away from said core;

c. detecting means connected to said armature and said sensor for detecting electrical engagement between said armature and said sensor; and

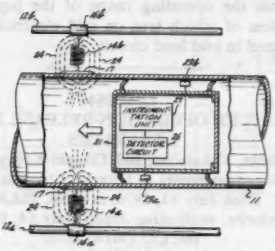
d. test time sequence signal generating means for controlling the operating timing of said detecting means, said power supply means and said sensor moving means so as to test said electromagnetic relay for the operating characteristic by supplying the operating current to said electromag-

netic coil while said sensor is positioned at said stand-by position, advancing said sensor to said detecting position in a predetermined period of time, and detecting the output of said detecting means, and so as to test said electromagnetic relay for the releasing characteristic by retracting said sensor to said stand-by position from said detecting position, switching over said power supply means to supply the releasing current to said electromagnetic coil in lieu of the operating current, advancing said sensor to said detecting position again in a predetermined period of time, and detecting the output of said detecting means.

4,061,965
METHOD AND APPARATUS FOR MONITORING A CATHODICALLY PROTECTED CORRODIBLE HOLLOW MEMBER

Earnest E. Nelson, Woodbury Heights, N.J., assignor to Mobil Oil Corporation, Dallas, Tex.

Filed May 24, 1976, Ser. No. 689,161
Int. Cl.² G01N *27/00*; G01R *31/12, 31/02*
U.S. Cl. 324—29 **19 Claims**



1. In a cathodic protection system for an elongate corrodible member routed through an electrolytic environment, said corrodible member having a longitudinally extending channel therethrough, said cathodic protection system including at least one sacrificial anode disposed within said electrolytic environment in spaced proximity to said elongate corrodible member, and connecting means for electrically connecting said sacrificial anode to said elongate corrodible member, an improved system for monitoring the condition of said cathodic protection system comprising:

first means, responsive to electrical current flowing through said connecting means, for establishing an electromagnetic field within said channel of said corrodible member, said electromagnetic field being proportional to said electrical current flowing through said connecting means; and

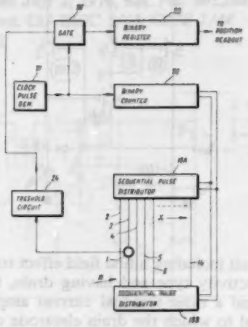
second means, positionable in said longitudinally extending channel of said corrodible member, for detecting the magnitude of said electromagnetic field established within said channel of said corrodible member and for supplying a signal representative of the magnitude of said electromagnetic field.

4,061,966
METHOD AND APPARATUS FOR GENERATING A CONTINUOUS MAGNETIC FIELD DETERMINING THE POSITION OF AN INDUCTIVE SENSING ELEMENT THEREIN

Pavel Sedlacek, Klecany, and Jiri Hajek, Prague, both of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Jan. 19, 1976, Ser. No. 650,020
Claims priority, application Czechoslovakia, Jan. 20, 1975, 374/75
Int. Cl.² G01R *33/12*
U.S. Cl. 324—207 **8 Claims**

1. In a method of electromagnetically determining the relative position of an inductive sensing element along a specified first direction, the method comprising the steps of exciting an array of parallel conductors sequentially arranged in the first direction and disposed in magnetic coupling relation with the sensing element with current pulses to vary the induced voltage response of the sensing element, and measuring the time of occurrence of a prescribed value of such induced voltage with respect to the start of an excitation interval of the conductors as a measure of the distance, in the first direction, of the sensing element from a reference point, the improvement wherein the

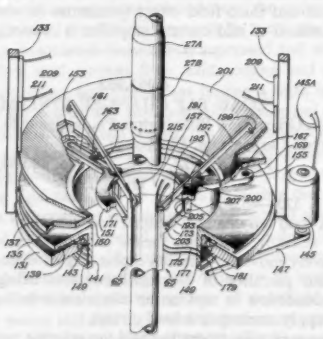


excitation step comprises energizing the conductors by a consecutive sequence of adjacent substantially rectangular voltage pulses to yield a resultant substantially continuous, travelling-wave magnetic field along the first direction to produce a correspondingly continuous induced voltage response in the sensing element and in which the measuring step comprises determining the instant relative to the start of the energization of the conductors at which the continuous voltage response induced in the sensing means reaches a predetermined value in a prescribed sense.

4,061,967
SUPPORT SYSTEM FOR ROTATABLE DETECTING ELEMENT

James R. Hall, Huffman, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Jan. 3, 1977, Ser. No. 756,576
Int. Cl.² G01R *33/12*
U.S. Cl. 324—260 **6 Claims**



1. A system for use with a detecting means for detecting identification symbols on drill pipe sections as they are moved vertically along a given path of travel by a drilling system employed for carrying out a drilling operations in the earths formations, said detecting means comprising a detecting element to be rotated around the drill pipe sections as they are

moved vertically along said path of travel, said system comprising:

stationary support means,

outer plate means having an opening for receiving said drill pipe sections as they are moved vertically along said path of travel by said drilling system,

said outer plate means being supported for rotation by said support means with said opening in line with said given path of travel,

means for rotating said outer plate means,

inner plate means having an opening for receiving said drill pipe sections as they are moved vertically along said path of travel by said drilling system,

the opening of said outer plate means being large enough to receive said inner plate means and to allow said inner plate means to be moved laterally with said opening of said outer plate means,

coupling means for supporting said inner plate means within said opening of said outer plate means and for coupling said inner plate means to said outer plate means for rotation therewith,

said coupling means allowing said inner plate means to move laterally relative to said outer plate means and to said support means to allow said inner plate means to remain generally concentric with said drill pipe sections as they are moved through said opening of said inner plate means, and

attaching means for attaching said detecting element to said inner plate means for rotation therewith and for locating said detecting element close to said drill pipe sections as they are moved through said opening of said inner plate means.

4,061,968

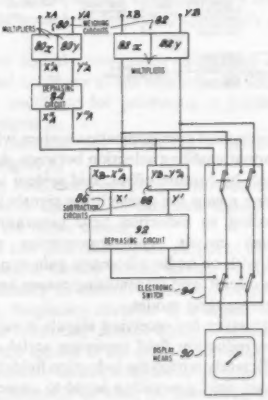
PROCESS OF AND APPARATUS FOR NON-DESTRUCTIVE EDDY CURRENT TESTING INVOLVES THE SUPPRESSION OF DISPLAYED LOBES CORRESPONDING TO FAULT PARAMETERS TO BE ELIMINATED FROM THE DISPLAY

Michel Pigeon, Bures-sur-Yvette, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Sept. 7, 1976, Ser. No. 720,599

Int. Cl.² G01R *33/12*

U.S. Cl. 324—40 **4 Claims**



1. Process for non-destructive testing by eddy currents of the kind in which:

a probe is displaced in the proximity of the workpiece to be tested,

said probe is supplied by an excitation current of *n* different frequencies,

the components of each of the *n* frequencies in the measurement signal are analysed,

the improvement comprising the steps of determining for each component, its resistive part X in phase with the excitation current at the same frequency, and its reactive part Y in quadrature,

modifying the phase and amplitude of the determined parts X_1 and Y_1 for the signal at a first frequency so that the component of that signal due to a parameter to be eliminated is made to coincide in phase and amplitude with the parts X_2 and Y_2 for the signal at a second frequency due to the same parameter,

subtracting the parts X_2 and Y_2 from the parts X_1 and Y_1 thus modified, which provides a new set of resistive and reactive parts X' and Y', permitting to be obtained a representative curve for which the contribution of the undesirable parameter has been eliminated, and displaying the signal of the components X' and Y' on a plane.

4,061,969

APPARATUS FOR TESTING PRINTED CIRCUIT BOARDS

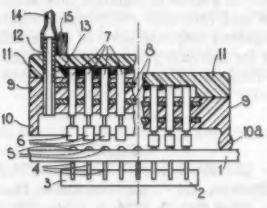
Anthony James Dean, Congleton, England, assignor to International Computers Limited, London, England

Filed May 5, 1976, Ser. No. 683,684

Claims priority, application United Kingdom, May 17, 1975, 21094/75

Int. Cl.² G01R *15/12*

U.S. Cl. 324—73 PC **12 Claims**

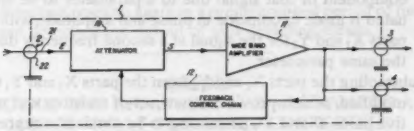


1. Apparatus for testing electrical installations on a planar circuit board which presents on a surface thereof a pattern of connections, the apparatus including; a group of probe members connectable to a circuit evaluation means; a plate like support means for mounting the probe members in alignment with each other such that the probe members conform to the pattern, and such that the probe members are individually displaceable with respect to the support means along the direction towards and away from the connections; sealing means connected with the support means, and effective in operation to form a closed boundary enclosing a space occupied by the probes and the connections and to enable a pneumatic clamp seal to be effected between the boundary and the circuit board thereby to maintain the support means and thus the probe members in a desired position with respect to the circuit board; a wall provided around the periphery of the support means to form therewith a cup like housing for the probe members and to co-operate with the space, deformable means associated with said chamber and co-operable with an air path between the chamber and space and means for producing within the space and chamber a pressure which is lower than that outside the boundary of the space so as to produce the pneumatic clamp effect when the seal is contacted with a board and also to cause the deformable means to load each probe into engagement with the circuit connections.

4,061,970
TRANSMISSION SYSTEM AND REPEATER STATIONS THEREFOR

Jean Magneron, Mezieres-les-Metz, France, assignor to E.L.-.A.P., Mondelange, France

Filed May 19, 1976, Ser. No. 687,739
Int. Cl.[2] H04B 7/14
U.S. Cl. 325—2 11 Claims



1. A repeater station for cable transmission of high frequency signals covering a predetermined wide band of frequencies and including a reference component having a predetermined frequency, said station comprising:

an equalizer including a resistor T pad having two transverse resistive members and one leg member, a series resonant circuit connected in parallel across both transverse resistive members of said T, and a parallel resonant circuit connected in series with said leg member of said T,

ends of said transverse resistive members defining input and output of said equalizer, while an end of said leg member is coupled to ground,

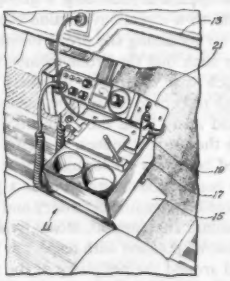
said two resonant circuits having an adjustment means for adjusting the resonant frequency of each, and

automatic control means having an input coupled to said equalizer output and output coupled to said adjusting means, said automatic control means responsive to a level of said reference cmmponent of said equalizer output to adjust the resonant frequencies of said two resonant circuits thereof and a corresponding substantially common frequency in a sense to maintain substantially constant said level of said reference component, whereby a signal level/frequency response slope of said equalizer is varied to correct for increasing losses in said transmitting cable of higher frequencies in said predetermined wide band frequencies.

4,061,971
CITIZEN BAND RADIO MOUNT

Morris R. Barrons, 801 Greenwood Drive, Denton, Tex. 76201

Filed Oct. 7, 1976, Ser. No. 730,345
Int. Cl.[2] H01B 1/38
U.S. Cl. 325—15 15 Claims



1. A Citizens' Band (CB) radio combination adapted to facilitate rapid installation and removal of a Citizens' Band radio into and from a vehicle having a floorboard, comprising:

a. a base tray adapted to conformably fit the floorboard of the vehicle; said base tray having a receiving tray depression of predetermined longitudinal, lateral and depth dimensions for receiving a base block;

b. a base block conformably and removably received in said receiving tray depression and dimensioned to fit closely and conformably therewithin; said base block having vacuum relief means facilitating installation and removal from said receiving tray depression;

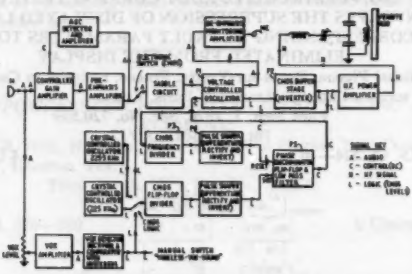
c. a mounting bracket connected with said base block and having means for connecting with a CB radio; said mounting bracket having angle adjusting means so as to fit a CB radio in said vehicle as desired; and

d. a CB radio having readily removable plug-in connectors for connections with a power source and with an antenna; said CB radio being connected to said mounting bracket so as to be set at a plurality of angles with respect to said base block and said base tray; such that said CB radio can be readily set into and lifted from said base tray by way of said mounting bracket and said base block to facilitate installation and removal from said vehicle, as for preventing theft, without requiring tools for unfastening dash mountings and the like.

4,061,972
SHORT RANGE INDUCTION FIELD COMMUNICATION SYSTEM

Victor Robert Burgess, 35 Koonawarra Avenue, Lindfield, New South Wales 2070, Australia

Continuation-in-part of Ser. No. 529,091, Dec. 3, 1974. This application Oct. 20, 1976, Ser. No. 734,381
Int. Cl.[2] H04B 1/38
U.S. Cl. 325—16 10 Claims



1. An induction field communication system which utilizes a modulation format enabling selection between similar electromagnetic signals by capture effect, said system comprising:

a. transmitting means for transmitting signals in said format and including an induction field generating aerial and microphone circuit, said transmitting means being equipped with an audio automatic gain control in its microphone circuit, said transmitting means having first and second transmitting modes,

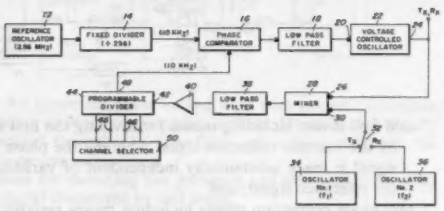
b. a signal receiver for receiving signals in said format and having an induction field receiving aerial, said receiver being sufficiently within the induction field directly generated by said field generating aerial to cause signals from said first transmitting means to capture said receiver to the exclusion of other similar signals received by said receiving aerail, and

c. control means for switching the transmitting means from said first transmitting mode to said second transmitting mode, said second transmitting mode being effective to switch the receiver to a different receiving mode.

4,061,973
SYNTHESIZER

Fred Alan Reimers, Lake in the Hills; Robert Martin Beckmann, Hanover Park; William Arthur Burzynski, Des Plaines; Dennis Eugene Tomlinson, Elgin, and William Henry Schwartz, Hoffman Estates, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1976, Ser. No. 670,296
Int. Cl.[2] H04B 1/40
U.S. Cl. 325—17 10 Claims

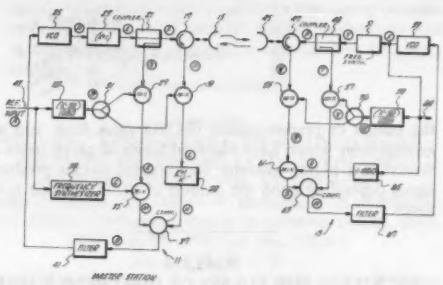


1. A frequency synthesizer for a transceiver comprising:
a reference oscillator means for generating a predetermined frequency signal;
a phase comparator means, having a pair of inputs and an output, for producing at its output an error signal representative of the difference in phase of signals applied to its inputs;
a means for coupling the reference oscillator means to the first phase comparator input;
a low pass filter means, coupled to the phase comparator output, for filtering the error signal;
a voltage controlled oscillator means, having a voltage control terminal and an output terminal, for producing an oscillator signal at its output the frequency of which is dependent on the signal applied to the voltage control terminal;
a means for coupling the filtered error signal to the voltage control terminal of the voltage controlled oscillator means;
a mixer means, having a pair of inputs and an output, for producing at its output a signal having a frequency equal to the difference in frequency of signals applied at its inputs;
a means for directly connecting the output of the voltage controlled oscillator to the first input of the mixer means;
a transmit oscillator for producing a predetermined frequency signal f_1;
a receive oscillator for producing a predetermined frequency signal f_2;
a means for switchably coupling either the transmit oscillator signal or the receive oscillator signal to the second input of the mixer means;
a means for low pass filtering the output of the mixer means;
a programmable divider means, having an input, an output, and a plurality of control terminals, for producing at its output a frequency division of a signal received at its input, the frequency divisor being programmably dependent on the signals at the control terminals;
a channel selector means, coupled to the control terminals of the programmable divider, for selectively controlling the frequency divisor of said divider;
a means for coupling the low pass filtered mixer output to the input of the progammable divider; and
a means for coupling the output of the programmable divider to the second input of the phase comparator means,
whereby the output of the voltage controlled oscillator means is adaptable for tuning the transceiver.

4,061,974
ULTRA STABLE FREQUENCY DISTRIBUTION SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Richard L. Sydnor, Altadena, and John W. MacConnell, La Canada, both of Calif.

Filed June 21, 1976, Ser. No. 699,002
Int. Cl.[2] H04B 1/50
U.S. Cl. 325—58 9 Claims



1. A system for distributing a reference signal to remote locations by radio frequency transmission, said system comprising:
a master station having a transmitting and receiving means, said master station including:
a variable phase oscillator means generating a signal for application to said transmitting means, said signal having a certain frequency and a phase related to its input signal;
means for receiving a reference signal having a standard frequency and phase;
means for mixing the reference signal with a transmitted signal and a received signal, respectively; and
comparison means for generating a signal representing the phase difference between the transmitted signal and the received signal from said mixing means, said phase difference signal being supplied to said oscillator as its input signal; and
a slave station having a transmitting and receiving means, said slave station including:
a variable phase oscillator means generating a signal for application to said transmitting means, said signal having a certain frequency and a phase related to its input signal, the generated signal having a frequency and phase substantially equal to the frequency and phase of the reference signal received at said master station; and
comparison means responsive to transmitted signal and a received signal for generating a signal representing the phase difference between said transmitted signal and said received signal, said phase difference signal being supplied to said oscillator as its input signal.

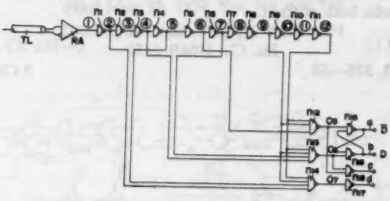
4,061,975
RECEIVER FOR PULSES OF DIFFERENT WIDTHS

Tetuya Sugai, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 459,718, April 10, 1974, Pat. No. 3,993,954.
This application Sept. 7, 1976, Ser. No. 720,766
Claims priority, application Japan, Apr. 11, 1973, 48-40401; Nov. 9, 1973, 48-125439
Int. Cl.[2] H03K 5/20
U.S. Cl. 325—322 1 Claim

1. A width-modulated pulse demodulator system for receiving pulses of different widths and decoding them, said demodulation system comprising an arrangement of series connected NAND gates formed in an integrated circuit, and a control circuit including additional NAND gates, said series arrangement receiving the pulses of different widths and passing said pulses through said series arrangement of NAND gates, the

output level of each NAND gate of said series arrangement at a given time after receiving a particular pulse being dependent upon the width of the particular pulse received, each of said additional NAND gates being respectively interconnected to



the output of predetermined NAND gates from said series arrangement which have identical levels at given times after receiving a pulse, whereby said control circuit produces a signal depending upon the outputs of predetermined NAND gates.

4,061,976

RECEIVERS FOR PULSES OF DIFFERENT WIDTHS

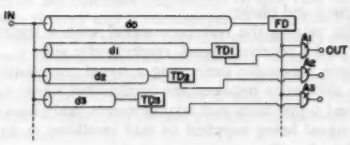
Tetuya Sugai, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 459,718, April 10, 1974, Pat. No. 3,993,954. This application Sept. 7, 1976, Ser. No. 720,767

Claims priority, application Japan, Apr. 11, 1973, 48-40401; Nov. 9, 1973, 48-125439

Int. Cl.² H03K *5/20*

U.S. Cl. 325—322 **10 Claims**



1. A width-modulated pulse demodulator system for receiving pulses of different widths and decoding them, said demodulator system comprising a plurality of delay elements each having a different delay time, each of said delay elements receiving said pulses of different widths, a front-edge-waveform detector circuit serially connected to the output of the delay element having the longest delay time, a plurality of rear-edge-waveform detector circuits each serially coupled to a respective one of the remaining delay elements, and a plurality of AND gates each having two inputs, one input of each AND gate being commonly connected to the output of said front-edge-waveform detector circuit, and the other input of each AND gate connected to a respective output of said rear-edge-waveform detector circuits.

4,061,977

PHASE TRACKING NETWORK

David M. Motley, Santa Ana, and Andrew M. Kameya, Costa Mesa, both of Calif., assignors to Hycom Incorporated, Irvine, Calif.

Filed May 17, 1976, Ser. No. 687,349

Int. Cl.² H03H *7/36*

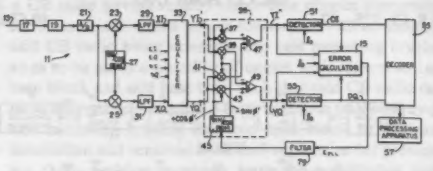
U.S. Cl. 325—323 **18 Claims**

7. An apparatus adapted to receive an input signal which contains phase error wherein the apparatus provides a variable reference signal which is an estimate of the level of the input signal, said apparatus comprising:

phase correction means responsive to the input signal for correcting at least some of the phase error to provide a phase corrected signal;

detector means responsive to the phase corrected signal for providing a detected signal;

error calculator means responsive to at least one of the phase corrected signal and the detected signal to provide a first signal which is related to said variable reference signal and first means responsive to the first signal for providing a phase error signal;



said first means including means for dividing the first signal by the variable reference signal whereby the phase error signal is made substantially independent of variations in the reference signal; and

said phase correction means including means responsive to the phase error signal for at least partially correcting of the phase error in the input signal.

4,061,978

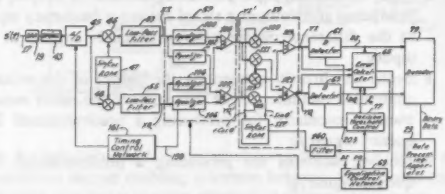
TIMING RECOVERY FOR AN AUTOMATICALLY EQUALIZED DATA MODEM

David M. Motley, Santa Ana; Naif D. Salman, Orange, and King Y. Cheng, Tustin, all of Calif., assignors to Hycom Incorporated, Irvine, Calif.

Continuation of Ser. No. 505,052, Sept. 11, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 710,655

Int. Cl.² H04B *1/10, 3/04;* H04L *7/00*

U.S. Cl. 325—324 **11 Claims**



9. An apparatus adapted to receive a distorted analog signal comprising:

first means for sampling the analog signal to provide a plurality of samples with adjacent samples being separated by a first interval of time, the samples being expressed in a digital format to form a distorted digital data signal;

equalizer means including a plurality of taps, each of the taps having a multiplying coefficient with characteristics for substantially equalizing the distorted digital signal to provide a substantially equalized signal;

second means responsive to the characteristics of the multiplying coefficient of at least one of the taps of the equalizer means to control the duration of the first interval of time; and

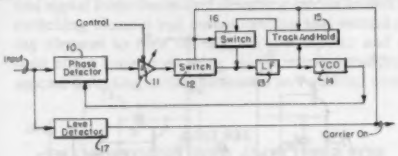
phase correction means for correcting the phase of at least one of the data signal and the equalized signal substantially independently of the multiplying coefficients.

4,061,979

PHASE LOCKED LOOP WITH PRE-SET AND SQUELCH

Andrew M. Walker, Gaithersburg, and Ova Gene Gabbard, Germantown, both of Md., assignors to Digital Communications Corporation, Gaithersburg, Md.

Filed Oct. 20, 1975, Ser. No. 624,092
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—419 9 Claims



1. An improved phase locked loop with pre-set capabilities including an input connected to a phase detector, and, serially connected thereafter, a loop filter and a loop oscillator, the improvement comprising,

means for detecting the presence and absence of a carrier signal connected to said input,

track and hold means having an input connected to said loop filter output and an output connected to an input of said loop filter and responsive to said means for detecting, for sensing and storing loop filter output in the presence of said carrier and for supplying a signal representative of said stored loop filter output to said loop filter input in the absence of said carrier to maintain the charge of the loop filter in substantially the same condition as when the carrier is present,

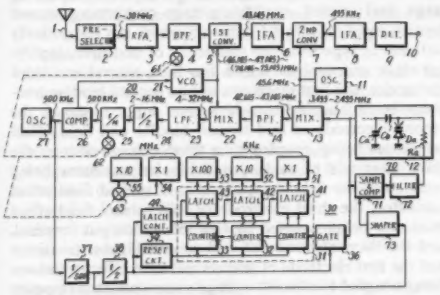
whereby said loop oscillator is pre-set in the absence of said carrier.

4,061,980

RADIO RECEIVER WITH PLURAL CONVERTERS AND FREQUENCY CONTROL

Tsutomu Sato, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 18, 1976, Ser. No. 733,528
Claims priority, application Japan, Oct. 21, 1975, 50-143113[U]
Int. Cl.[2] H04B 1/26
U.S. Cl. 325—419 3 Claims



1. A radio receiver comprising:

a. first and second frequency converters for producing first and second intermediate frequency signals;

b. a first oscillator for generating a first local signal to be supplied to said second frequency converter;

c. a variable frequency oscillator,

d. a first mixer for producing a beat signal between said first local signal and an output signal generated by said variable frequency oscillator;

e. a variable frequency divider for producing a signal having a predetermined frequency based on said beat signal;

f. a second oscillator for generating a reference signal having the frequency same as that of the signal produced by said variable frequency divider;

g. a comparison circuit for comparing the phase of said reference signal with that of said signal produced by said variable frequency divider and for producing a control signal;

h. a voltage controlled oscillator for generating a second local signal to be supplied to said first frequency converter in response to said control signal; and

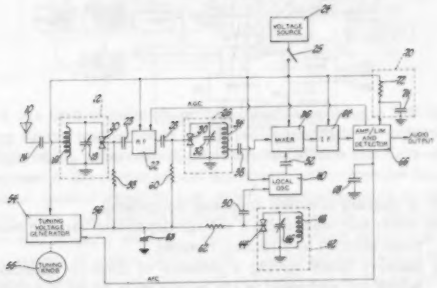
i. a second mixer which is supplied with the second local signal and beat signal and produces a beat signal between both the signals, said last beat signal produced by said second mixer being supplied to said variable frequency divider.

4,061,981

VOLTAGE VARIABLE CAPACITOR TUNED RADIO RECEIVER HAVING DELAYED AUTOMATIC FREQUENCY CONTROL AT TURN-ON

Thomas E. Endres, and Donald W. Rodeman, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 18, 1976, Ser. No. 715,394
Int. Cl.[2] H04B 1/26
U.S. Cl. 325—419 3 Claims



1. A radio frequency receiver comprising: at least one tunable stage whose tuned frequency determines the receiver response to an incoming RF carrier signal, the tunable stage including a voltage variable capacitor and having a tuned frequency determined by the value of a bias voltage across the voltage variable capacitor; means effective upon energization of the receiver to supply a bias voltage across the voltage variable capacitor, the bias voltage increasing to a selected bias voltage value corresponding to a selected tuned frequency after a time delay determined by circuit parameters following initial energization of the radio receiver, the selected bias voltage value providing receiver response to a selected incoming RF carrier signal, the tuned frequency varying toward the selected tuned frequency as the bias voltage value increases to the selected bias voltage value; a frequency control circuit effective to vary the bias voltage in amount and sense tending to adjust the tuned frequency to obtain a maximum receiver response condition to an incoming RF carrier signal, the frequency control circuit tending to effect adjustment of the tuned frequency to obtain a maximum receiver response condition to an incoming RF carrier signal different from the selected RF carrier signal when the tuned frequency of the tunable stage corresponds to said different incoming RF signal while the bias voltage value increases to the selected bias voltage value; and a delay circuit effective upon energization of the receiver to inhibit operation of the frequency control circuit for a time at least equal to the time delay required for the tuning voltage to attain the selected tuning voltage value after the receiver is first energized, the frequency control circuit being rendered inoperative by the delay circuit to adjust the tuned frequency of the tunable stage to obtain maximum

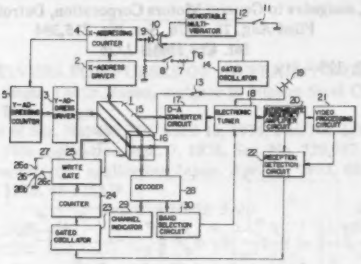
receiver response to an incoming RF carrier signal different from a selected RF carrier signal.

4,061,982

CHANNEL SELECTION APPARATUS PROVIDED WITH MEMORY FOR DIGITALIZING AND STORING CHANNEL SELECTION VOLTAGE

Kazumi Kawashima, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 26, 1976, Ser. No. 652,318
Claims priority, application Japan, Feb. 6, 1975, 50-16044
Int. Cl.² H04B *1/06*
U.S. Cl. 325—464 **5 Claims**



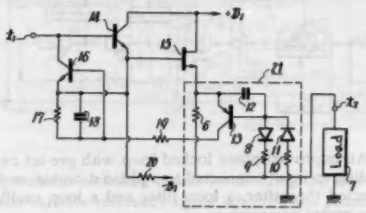
1. A channel selection apparatus comprising;
an electronic tuner using a voltage-dependent variable reactance element as a turning element,
a memory block having a plurality of memory addresses which are addressed in the matrix state by an X-address and a Y-address, said memory block storing digital voltage signals at said memory addresses which are digital versions of a plurality of channel selection voltages to be applied to said voltage-dependent reactance element for selecting a plurality of channels, said memory block further storing skip control signals for controlling whether the channels corresponding to the respective memory addresses are to be selected or to be skipped,
an addressing circuit for specifying an address to be read out of said memory block comprising an X-addressing counter for addressing an X-address of said memory block and a Y-addressing counter for addressing a Y-address of said memory block, said Y-addressing counter being controlled by the final bit output of said X-addressing counter,
a switch,
a monostable multivibrator for generating a pulse signal when said switch is operated, said multivibrator supplying a pulse signal to said X-addressing counter for shifting the read-out address by one address,
a skipping pulse generating circuit connected to the output of said memory block for activating said addressing circuit to step the readout address by one when said skip control signal read out of said memory block at the address specified by said addressing circuit indicates that a skipping pulse is to be supplied to said X-addressing counter, and
a digital to analog converter for converting the digital voltage signals read out of said memory block at the address specified by said addressing circuit to an analog channel selection voltage for application to the voltage-dependent variable reactance element of said electronic tuner.

4,061,983

TRANSISTOR AMPLIFIER WITH PROTECTIVE CIRCUIT

Tadao Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 8, 1975, Ser. No. 638,297
Claims priority, application Japan, Dec. 11, 1974, 49-142334
Int. Cl.² H03F *21/00*
U.S. Cl. 330—207 P **10 Claims**



1. The combination of a transistor amplifier and an associated protective circuit comprising:
a first amplifying stage having input and output terminals, said first amplifying stage comprising a bipolar transistor with a field effect transistor having a triode characteristic, low output impedance and large convergence conductance, each of said transistors having first, second and third electrodes, the first electrode of said bipolar transistor being coupled to said input terminal, the second electrodes of said bipolar and field effect transistors being coupled to a first voltage source, the third electrode of said bipolar transistor being coupled to the first electrode of said field effect transistor, the third electrode of said field effect transistor being coupled to said output terminal, and the third electrode of said bipolar transistor and the first electrode of said field effect transistor being coupled to a second voltage source which has a polarity opposite to that of the first voltage source;
a load connected to the output terminals of said first amplifying stage;
a second amplifying stage having a second input terminal coupled to said input stage and a second output terminal coupled to said output terminal of said first amplifying stage and amplifying a signal having a different polarity from that of said signal applied to said first amplifying stage, said second amplifying stage comprising second bipolar and field effect transistors which are respectively different in type from the transistors of said first amplifying stage and each of which has first, second and third electrodes, the first electrode of said second bipolar transistor being coupled to said second input terminal, the second electrode of said second bipolar and field effect transistors being coupled to a third voltage source, the third electrode of said second bipolar transistor being coupled to the first electrode of said second field effect transistor, the third electrode of said second field effect transistor being coupled to said second output terminal, and the third electrode of said second bipolar transistor and the first electrode of said second field effect transistor being coupled to a fourth voltage source which is opposite in polarity to said third voltage source;
a first detecting circuit for detecting an overload condition of said amplifying stage thereby to produce a control signal;
a second detecting circuit for detecting an overload condition of said second amplifying stage thereby to produce a second control signal;
a first muting circuit connected to said input terminals of said amplifying stage, said first muting circuit including a switching element coupled between the first and third electrodes of said bipolar transistor, and means for applying a control signal from the first detecting circuit to said

switching element and means causing said switching element to turn off said bipolar and field effect transistors, when said control signal indicates an overload condition; and

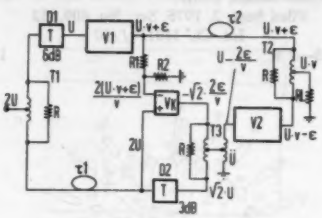
a second muting circuit connected to said second input terminal of said second amplifying stage, said second muting circuit comprising a second switching element coupled between the first and third electrodes of said second bipolar transistor; and means for applying a control signal from the second detecting circuit to said second switching element and means causing said second switching element to turn off said second bipolar and second field effect transistors when said control signal from said second detecting circuit indicates an overload condition.

4,061,984

TRANSISTOR POWER AMPLIFIER FOR TRANSMITTING SYSTEMS

Johann Gerhard Zirwas, Groebenzell, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 8, 1976, Ser. No. 721,475
Claims priority, application Germany, Sept. 24, 1975, 2542638
Int. Cl.² H03F *1/26*
U.S. Cl. 330—149 **3 Claims**



1. A transistor power amplifier for transmission systems, particularly in the short-wave range, comprising:

a power amplifier input, a power amplifier output, and first and second parallel-connected signal paths extending between said power amplifier input and said power amplifier output;

first amplifier means in said first signal path including an input coupled to said power amplifier input and an output, and having a first predetermined delay time and operable to subject input signals to an error;

second amplifier means in said second signal path including an input and an output and having a second predetermined delay time;

first delay means in said second signal path including an input coupled to said power amplifier input and an output, and operable to simulate said first predetermined delay time;

second delay means in said first signal path including an input connected to said output of said first amplifier means and an output, an operable to simulate said second predetermined delay time;

output means connecting said output of said second delay means and said output of said second amplifier means to said power amplifier output;

signal branching means connected to said output of said first amplifier means for providing a portion of the output signal of said first amplifier means;

correction amplifier means comprising a differential amplifier including first and second inputs and an output, said first input connected to said output of said first delay means, said second input connected to said signal branching means, and said differential amplifier operable to provide a correction signal which includes the error component produced in said first amplifier means inverted and of twice the magnitude thereof; and

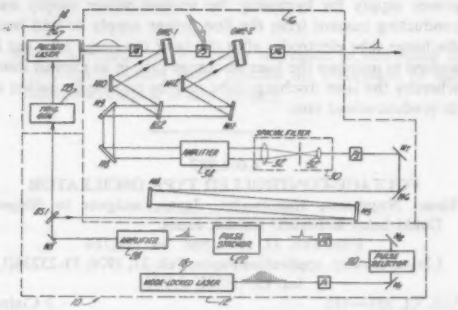
signal combining means coupling said output of said first delay means and said output of said differential amplifier to said input of said second amplifier means, comprising a transformer including a primary winding coupled to said output of said first delay means and to said output of said differential amplifier and a secondary winding connected to said input of said second amplifier means.

4,061,985

LASER FUSION PULSE SHAPE CONTROLLER

Larry D. Siebert, Ann Arbor, Mich., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Filed Jan. 16, 1976, Ser. No. 649,864
Int. Cl.² H01S *3/10*
U.S. Cl. 331—94.5 C **7 Claims**



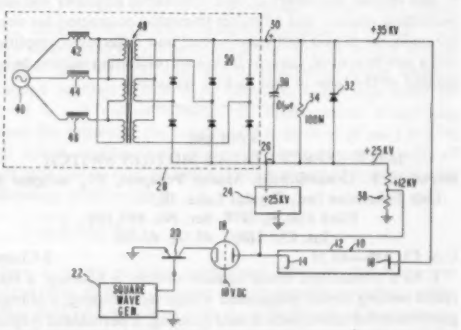
1. An optical pulse shape controller comprising a first energy source responsive to an optical trigger signal to generate a light beam, a Kerr-effect gate including at least one Kerr cell disposed at the output of said first source and responsive to an optical control signal to gate only a selected portion of said light beam, said selected portion being a function of the duration and intensity pattern of said optical control signal, a second source of pulsed light energy, and means disposed at the output of said second source and responsive to an output light pulse from said second source to provide said optical trigger signal and said optical control signal of preselected duration and intensity pattern.

4,061,986

SOFT POWER SUPPLY FOR PULSED LASER

Gerald C. Barker, Palo Alto, Calif., assignor to Coherent Radiation, Palo Alto, Calif.

Filed Jan. 2, 1976, Ser. No. 646,330
Int. Cl.² H01S *3/09, 3/097*
U.S. Cl. 331—94.5 PE **6 Claims**



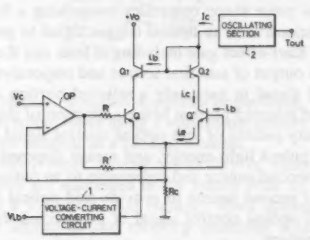
1. In combination, a laser discharge tube adapted for repetitive pulsed operation and having first and second electrodes

and containing a gas capable of being ionized by electrical discharge between the first and second electrodes, switching means for repetitively energizing said pulsed laser discharge tube at a predetermined frequency by selectively providing a current path through said discharge tube, a first direct current power supply, a second direct current, current limited power supply connected across the electrodes of the laser discharge tube and in series with the first power supply and the switching means, the second power supply including means for reducing its output to a minimal predetermined value when the current drawn from it is equal to the current drawn by the laser discharge tube when said gas within said tube is ionized during each pulsed energization of the discharge tube, and diode means connected in parallel with the output of the second power supply for bypassing the second power supply and conducting current from the first power supply to said laser discharge tube electrodes after the laser discharge tube gas is ionized to maintain the laser discharge tube in its ionized state, whereby the laser discharge tube may be repeatedly pulsed at its predetermined rate.

4,061,987
VOLTAGE-CONTROLLED TYPE OSCILLATOR

Yasuo Nagahama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Feb. 22, 1977, Ser. No. 770,714
Claims priority, application Japan, Feb. 27, 1976, 51-23236[U]
Int. Cl.² H03K 3/282
U.S. Cl. 331—111 3 Claims



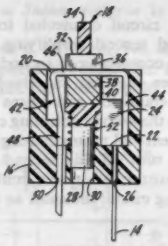
1. A voltage-controlled oscillator having a differential amplifier including a first and a second transistors base-biased equally by a voltage produced in response to an input control voltage, and an oscillating section connected to a collector of said second transistor for oscillating a signal having a frequency proportional to a collector current of said second transistors of said differential amplifier, comprising a *p–n* junction semiconductor element connected between the collector of said second transistors of said differential amplifier and said oscillating section, and a further transistor connected between the collector of said first transistor of said differential amplifier and a power source, current from said oscillating section being applied to the base of said further transistor.

4,061,988
HALL EFFECT LINEAR MOTION SWITCH

Raymond F. Lewandowski, Mount Prospect, Ill., assignor to Oak Industries Inc., Crystal Lake, Ill.

Filed Feb. 9, 1976, Ser. No. 656,106
Int. Cl.² H01L 43/04, 43/06
U.S. Cl. 338—32 H 9 Claims

1. In a contactless linear motion switch, a housing, a Hall effect sensing circuit positioned within said housing, a plunger positioned for movement in said housing, a permanent magnet carried by said plunger for movement toward and away from said Hall effect sensing circuit, and a concentrator fixed in position within said housing, said concentrator having a portion extending adjacent said Hall effect sensing circuit and a further portion positioned in contact with said magnet when

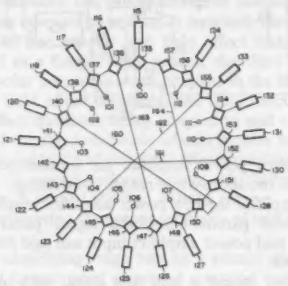


said magnet is positioned away from said Hall effect sensing circuit.

4,061,989
REDUNDANCY SWITCHING SYSTEM

Peter G. Petrelis, Huntington Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Sept. 2, 1975, Ser. No. 609,852
Int. Cl.² H01P 1/10
U.S. Cl. 333—7 R 12 Claims



1. In a transponder for a communication system, a redundancy switching system comprising:

a. a first plurality of elements, said elements being identical;

b. a second plurality of terminals for transmitting or receiving a plurality of signals of different frequencies and representing different data, said second plurality being no more than said first plurality; and

c. switching means connected to each of said elements, said switching means being interconnected in a closed loop, some of said elements being standby elements, whereby upon failure of one of said elements a standby element is connectable by at least one of said switching means to one of said terminals.

4,061,990
FREQUENCY COMBINING CIRCUIT

Tomoki Ueno, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 26, 1976, Ser. No. 735,416
Claims priority, application Japan, Oct. 27, 1975, 50-129482
Int. Cl.² H01P 5/18
U.S. Cl. 333—10 5 Claims

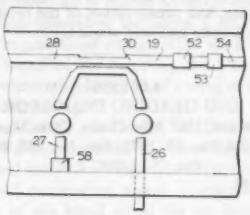
1. A frequency combining circuit in the form of a planar transmission circuit and operative in a selected frequency band, said frequency combining circuit comprising:

a four-port directional coupler having a coupler input port for receiving a first frequency signal in a first frequency

band, a first coupler branch line coupled to said coupler input port, a coupler output port coupled to said first coupler branch line for receiving said first frequency signal from said coupler input port through said first coupler branch line, a coupler forward coupling port coupled to said first coupler branch line for receiving a portion of said first frequency signal, a second coupler branch line coupled to said coupler forward coupling port, and a coupler backward coupling port coupled to said second coupler branch line and also coupled to said first branch line;

a first transmission line coupled at one end thereof to said coupler backward coupling port;

first filter means coupled to the other end of said first transmission line for receiving a second frequency signal from a signal source, said second frequency signal being in a second frequency band separated from said first frequency band, said first filter means having a filtering property for rejecting said first frequency signal and passing therethrough said second frequency signal to said first transmission line and hence to said coupler backward coupling port, a portion of said second frequency signal being transferred to said coupler output port, and the other portion of said second frequency signal being transferred



to said coupler forward coupling port through said second coupler branch line;

a second transmission line coupled at one end thereof to said coupler forward coupling port for passing therethrough to the other end thereof said portion of said first frequency signal from said coupler forward coupling port;

second filter means coupled to said other end of said second transmission line and having a filtering property for rejecting said first frequency signal and passing therethrough said second frequency signal; and

a load to which said second filter means is also coupled, said portion of said first frequency signal passed through said coupler forward coupling port and said second transmission line being rejected by said second filter means and being returned to said coupler forward coupling port through said second transmission line, and said other portion of said second frequency signal passed through said second coupler branch line, said coupler forward coupling port and said second transmission line being passed through said second filter means and being absorbed by said load, and the pass band of said frequency combining circuit for said first frequency signal being varied by varying the length of said first transmission line and the length of said second transmission line.

4,061,991

SEEDED FLAME MICROWAVE POWER LOAD

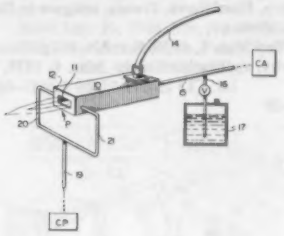
Michael A. Hamid, Winnipeg, and Lyall G. Rowlandson, Ottawa, both of Canada, assignors to Minister of Defense, Canadian Government, Canada

Filed Jan. 21, 1976, Ser. No. 650,956
Claims priority, application Canada, Jan. 28, 1975, 218838
Int. Cl.[2] H01P *1/24*
U.S. Cl. 333—22 R **16 Claims**

1. A microwave energy absorbing device, comprising:

a wave guide for guiding a microwave signal;

means for forming a flame across said wave guide; and



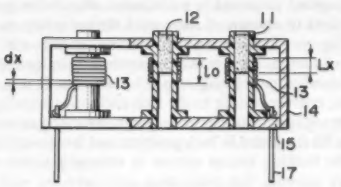
means for supplying a seeding substance to said flame to produce a plasma flame column for absorption of said microwave signal in said column.

4,061,992

HELICAL RESONATOR FILTER

Takahiro Inokuchi, Sakado, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Aug. 14, 1975, Ser. No. 604,885
Claims priority, application Japan, Aug. 21, 1974, 49-95978
Int. Cl.[2] H01P *5/04, 7/06;* **H03H** *7/10*
U.S. Cl. 333—73 R **1 Claim**



1. A helical resonator filter including hollow bobbins arranged on a base plate in predetermined spaced relationship with each other, helical resonators comprising helical coils each constituted by a wire-like member wound on said hollow bobbins respectively, said helical resonators being directly coupled without obstruction, magnetic cores adjustably inserted in said hollow bobbins, the improvement comprising means for adjusting the length of that portion of each helical coil which overlaps each associated magnetic core axially of said each helical coil, said means being arranged to provide the following relationship:

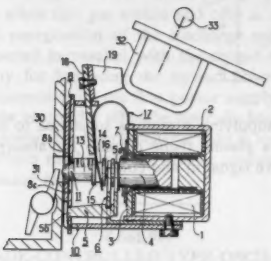
$$k \propto P \cdot F(L_x, dx)$$

where k is the coupling coefficient between the respective helical coils, dx is the diameter of said wire-like member constituting each of said helical coils, L_x is the length of that portion of each magnetic core which is inserted in or overlapped by each helical coil, and P is a constant, whereby desired elctromagnetic coupling can be adjustably established between the respective helical coils via said magnetic cores.

4,061,993
TRIPPING DEVICE FOR PRE-SELECTION OF FUNCTION FOR ELECTRICAL EQUIPMENT

Jean Hennemann, Hombliéres, France, assignor to Unelec S.A., Paris Cedex, France

Filed Mar. 1, 1976, Ser. No. 662,932
Claims priority, application France, Mar. 6, 1975, 75.06966
Int. Cl.[2] H01H *83/20*
U.S. Cl. 335—20 10 Claims



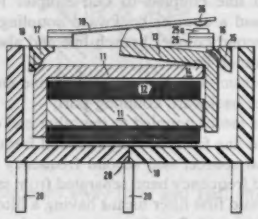
1. A tripping device having two selectable configurations comprising electromechanical control means having energized and deenergized states and including a mobile member having retracted and extended positions related to the state of the electromechanical control means, striker means operatively coupled to said mobile member for operating a circuit breaker depending upon the state of said electromechanical control means, displaceable locking means having a lock position for holding the striker means in a locked position, and coupling means between the mobile member and said locking means for displacing the locking means, upon change of energization state of the electromechanical control means, from said lock position to a release position in which the striker means can trip the circuit breaker, said electromechanical control means in one configuration of the tipping device going from energized to deenergized state and in a second configuration going from deenergized to energized state, said striker means including a projecting part forming a catch which engages with said locking means such that the striker means is held in locked position, said projecting part being movable between first and second positions, corresponding to the first and second configurations, in which said projecting part respectively engages said locking means with the latter in lock position and is released therefrom when the locking means moves to release position such that solely by moving the projecting part between said first and second positions the tripping device is placed into the selected configuration.

4,061,994
MINIATURE RELAY WITH BEARING SUPPORTS ASSOCIATED WITH THE HOUSING

Werner Minks, Reime-Siedlung, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 8, 1976, Ser. No. 675,157
Claims priority, application Germany, Apr. 15, 1975, 2516502
Int. Cl.[2] H01H *9/02*
U.S. Cl. 335—202 13 Claims

1. A relay structure comprising:
an electromagnet assembly including a coil about a generally central axial magnetic core piece and a yoke piece providing a pair of magnetic poles at a first end of said electromagnet assembly in the form of the generally flat ends of said yoke and core pieces, said yoke piece having an outer edge at said first end, and further being magnetically connected to said core at the second end of said electromagnet assembly;
a generally L-shaped armature piece placed at said first end with the vertex of its obtuse interior angle in contact with said yoke piece outer edge, a first leg of said armature being located so as to be magnetically pulled to said core piece thereby tilting said armature about said vertex;
a housing containing said electromagnet assembly and said armature piece;
and means comprising a pair of shoulder pieces located

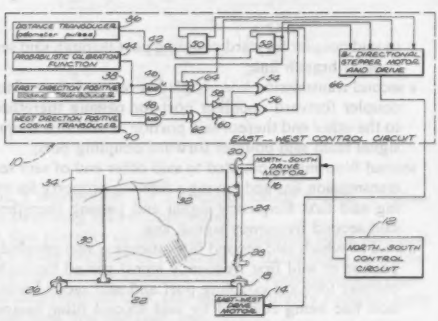


within said housing, one of said shoulder pieces bearing against the outside surface of said armature opposite said vertex and the other bearing against said yoke adjacent said second end, thereby to provide axial constraint for the assembly comprising said electromagnet assembly and said armature, and preservation of the relative axial positions of said yoke and said armature.

4,061,995
ODOGRAPH AND HEADING INDICATOR THEREFOR

John T. McCrickerd, 1857 Elba Circle, Costa Mesa, Calif. 92626

Filed Jan. 23, 1975, Ser. No. 543,391
Int. Cl.[2] G08G *1/12*
U.S. Cl. 340—24 15 Claims



1. An odograph, comprising:
odometer means for generating first electrical signals in accordance with distance traveled by a vehicle;
a magnetic compass element having a support and a spherical surface pivoted on said support for rotative response to the earth's magnetism, and including a predetermined reflective surface portion having greater light reflectivity than remaining portions of said surface;
illumination means for directing light rays toward at least a portion of said spherical surface;
a plurality of lenses for focusing said light rays onto said spherical surface and movable to cause said light rays to simultaneously traverse said spherical surface along a plurality of paths for coincidence with said reflective surface portion;
means for sensing said coincident light rays and generating a second electrical signal in correspondence thereto;
means for moving said lens means along a path respective said compass element whereby the extent of said second electrical signal generated as a result of said coincidence corresponds to the heading of said vehicle; and

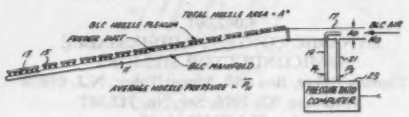
position indicator means responsive to coincidence of said first and second electrial signals to indicate the location of said vehicle.

4,061,996

STATUS MONITORING APPARATUS FOR BLC SYSTEMS

Alankar Gupta, Renton, Wash., and Delmar M. Fadden, Hampton, Va., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 28, 1975, Ser. No. 626,049
Int. Cl.[2] G08B *29/00*
U.S. Cl. 340—27 R 6 Claims



1. In an aircraft Boundary Layer Control (BLC) system wherein engine bleed air is ducted to an air delivery and momentum injection subsystem including a BLC manifold for receiving said engine bleed air and BLC nozzle plenums connected to the manifold for directing the bleed air from the manifold to predetermined regions of a wing of the aircraft, the improvement comprising:

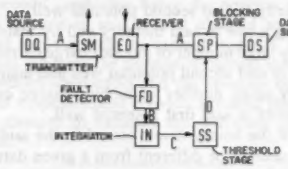
monitoring means for monitoring the flow of engine bleed air to said BLC manifold to detect failures in said air delivery and momentum injection subsystem of said BLC system, said monitoring means monitoring an air flow parameter of the bleed air at the air inlet of said BLC manifold.

4,061,997

CIRCUIT ARRANGEMENT FOR THE RECEPTION OF DATA

Dieter Niethammer, and Werner Paetsch, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 18, 1975, Ser. No. 632,911
Claims priority, application Germany, Nov. 20, 1974, 2455028
Int. Cl.[2] G06F *11/00*
U.S. Cl. 340—146.1 AX 6 Claims



1. A circuit arrangement for preventing reception of faulty data transmitted from a data source to a data sink in a data transmission system having a fault discriminator which emits a fault signal when there is a fault in the data signal, comprising:

integrating means for receiving said fault signal and producing therefrom an integrated fault signal,

threshold signal means for producing a blocking signal when said integrated fault signal reaches or exceeds a predetermined value, and

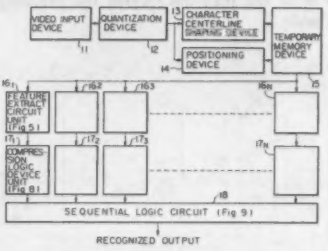
blocking means responsive to said blocking signal for blocking the processing of said data in said data sink.

4,061,998

CHARACTER RECOGNITION EQUIPMENT

Chiaki Ito, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed July 20, 1976, Ser. No. 707,115
Claims priority, application Japan, July 26, 1975, 50-91789
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 AC 5 Claims



1. A character recognition system comprising:

a video input device which obtains character video signals by raster scanning characters which exist on a medium;

a quantization unit which converts said character video signals into binary code video signals;

a character centerline shaping device which transforms said binary code video signals into character centerline figures;

a temporary memory device which temporarily stores said character centerline figures;

a feature extract device which divides said character centerline figures in said temporary memory device into divided regions with lines, said lines being in the scanning direction or being at right angles wiith respect to said scanning direction, said divided regions being composed of columns having *n* bits which device takes out every column of partial centerline figures in said divided regions, said solumn being at a right angle with respect to said lines, and which device extracts the positions of a start point of said partial centerline figures in every divided region, positions of end points of said partial centerline figures in said every divided region, and displacements of said partial centerline figures from said start points to said end points, and;

a sequential logic circuit which decides the categories of the character based on a sequence of the outputs of said feature extract device.

4,061,999

DYNAMIC RANDOM ACCESS MEMORY SYSTEM

Robert J. Proebsting, Richardson, and Paul R. Schroeder, Dallas, both of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Dec. 29, 1975, Ser. No. 644,857
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—182 20 Claims

1. The dynamic random access memory comprising an integrated MOSFET circuit including:

a plurality of storage cells arrayed in rows and columns,

a sense amplifier for each column,

a true digit line and a complement digit line for each sense amplifier, the storage cells in each column being connected to at least one of the respective digit lines when the respective storage cells are enabled by a row enable signal;

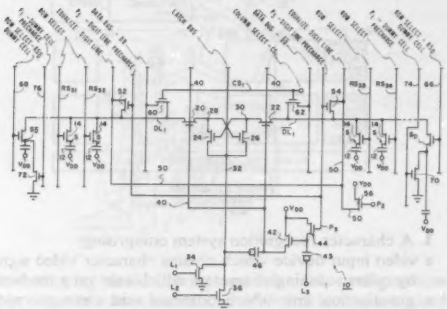
row enable means for each row for enabling the storage cells in the respective rows by transferring data stored therein to the digit lines for the respective columns;

each sense amplifier having true and complement input nodes each having a relatively small capacitance value when compared to the capacitance value of the respective true and complement digit lines, each amplifier including

a first transistor connecting the true input node to a latch node and a second transistor connecting the complement input node to the latch node, the gate of the first transistor being part of the complement input node and the gate of the second transistor being part of the true input node;

first impedance means connecting the true digit line to the true input node, and second impedance means connecting the complement digit line to the complement input node;

latch node control means for maintaining a precharge on the latch node and then discharging the precharge on the latch node;



digit line precharge means for precharging the digit lines such that substantially the same precharge voltage level is on both true and complement digit lines; and

control circuit means for sequentially producing a row enable signal for the storage cells in a selected row to connect the storage cells in the selected row to the respective digit lines and then causing the latch node control means to discharge the latch node whereby one of the digit lines will be discharged and the other not significantly discharged.

4,062,000

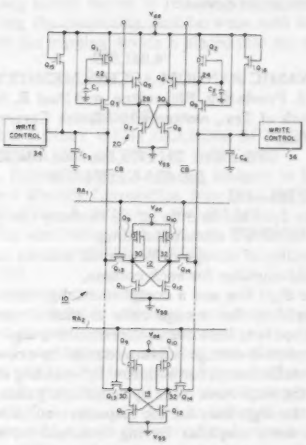
CURRENT SENSE AMP FOR STATIC MEMORY CELL

Robert Murray Donnelly, Carrollton, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Continuation of Ser. No. 511,572, Oct. 3, 1974, Pat. No. 3,967,252. This application Jan. 30, 1976, Ser. No. 654,013

Int. Cl.² G11C *7/00, 7/06*

U.S. Cl. 365—203 **1 Claim**



1. The method for reading data from a static memory cell of an integrated circuit memory having a d.c. current path from a sense bus to a source supply voltage means when addressed representing one logic state which comprises

precharging the sense bus from a voltage source through a field effect transistor to a predetermined voltage level, then

addressing the memory cell to initiate the d.c. current path, and

detecting the current flow through the sense bus as an indication of the logic state of the cell before the voltage of the sense bus has been substantially reduced.

4,062,001

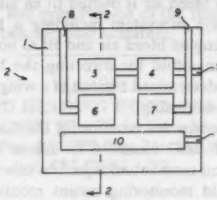
DYNAMIC CONTENT ADDRESSABLE SEMICONDUCTOR MEMORY

Roger Thomas Baker, Box 240, Mount Tabor, N.J. 07878

Filed Aug. 12, 1976, Ser. No. 713,687

Int. Cl.² G11C *11/40*

U.S. Cl. 365—49 **6 Claims**



1. A method of operating a semiconductor memory cell, comprised of the steps of

utilizing a first electrode in proximity to a semiconducting substrate to form in said semiconducting substrate, a first potential well for mobile charge carriers of one polarity,

utilizing a second electrode in proximity to said semiconducting substrate to form in said semiconducting substrate, a second potential well for mobile charge carriers of said polarity,

storing binary datum in said memory cell by

representing a zero in said memory cell by maintaining a relatively large number of mobile charge carriers of said polarity in said first potential well, and maintaining a relatively small number of mobile charge carriers of said polarity in said second potential well,

representing a one in said memory cell by maintaining a relatively large number of mobile charge carriers of said polarity in said second potential well and maintaining a relatively small number of mobile charge carriers of said polarity in said first potential well,

determining if the binary datum stored in the said memory cell is the same as or different from a given datum by,

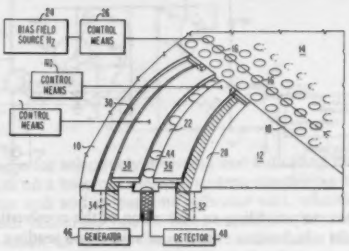
if the said given datum is a zero, operating on the said second potential well such that some of any mobile charge carriers of said polarity stored in said second potential well are extracted therefrom, while maintaining the number of mobile charge carriers of said polarity stored in said first potential well, substantially unchanged,

if the said given datum is a one, operating on the said first potential well such that some of any mobile charge carriers of said polarity stored in said first potential well are extracted therefrom, while maintaining the number of mobile charge carriers of said polarity stored in said second potential well, substantially unchanged.

4,062,002
DEVICE FOR BIASING BUBBLE DOMAINS

David Malcolm Hannon, Palo Alto, and Hung Liang Hu, Sunnyvale, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,881
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—27 10 Claims



1. A device having a film of bubble material on a substrate and adapted for the use in an external bias field between 0 and 0.4 ($4\pi M_s$) comprising:

a first channel in said film having a first stripe domain therein, said first channel being of sufficient width to permit said first stripe domain to expand in width when said external bias field is lowered wherein the flux from said first stripe increases to counteract the effect of the lower external bias field,

a second channel in said film having a second stripe domain therein, said second channel being parallel to said first channel, said second channel being of sufficient width to permit said second stripe domain to expand in width when said external bias field is lowered wherein the flux from said second stripe increases to counteract the effect of the lower external bias field,

a third channel in said film positioned between said first channel and said second channel and adapted for the movement of a bubble there-through,

a first conductor in juxtaposition with said first channel and said third channel and adapted for the current therein to flow in a first direction, said first conductor fixing the position of said first stripe domain in said first channel and causing said first stripe domain to expand in width in said first channel, and

a second conductor in juxtaposition with said second channel and said third channel and adapted for the current therein to flow in a direction opposite said first direction, said second conductor fixing the position of said second stripe domain in said second channel and causing said second stripe domain to expand in width in said second channel, wherein the passage of current through said first and second conductors and the presence of said first and second stripe domains provide a biasing field around said third channel to increase the operating margin of said device.

4,062,003
ONE-LEVEL MAGNETIC BUBBLE SWITCHING DEVICE

Peter K. George, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed July 30, 1976, Ser. No. 709,989
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—16 4 Claims

1. A one-level transfer switch for use with magnetic bubble domains comprising

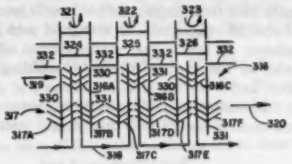
a first propagation path comprising at least one column of chevrons,

a second propagation path comprising at least two columns of chevrons,

all of the columns of chevrons having the apices thereof pointing in the same direction,

the apices of said one column of chevrons aligned with the gap between said at least two columns of chevrons, and

a pair of substantially parallel conductor elements arranged



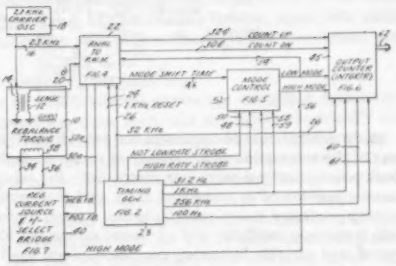
on opposite sides of the apices of the chevrons in said one column and said gap between said at least two columns of chevrons,

said pair of conductor elements joined together at one end thereof by means of at least one chevron in said one column.

4,062,004
DUAL RANGE, TORQUE REBALANCING OF INERTIAL SENSOR

James P. Roantree, West Hartford, and Glenn A. Swartzentruber, Simsbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 2, 1976, Ser. No. 663,175
Int. Cl.[2] G08C *19/02*
U.S. Cl. 340—187 7 Claims



5. Apparatus for use with a torque rebalanced inertial sensor having a torque rebalance winding which restores the position of the sensor against inertial forces acting thereon in response to currents applied thereto, and providing an output signal indicative of inertial changes being sensed thereby, comprising:

timing means providing a plurality of related, cyclic timing signals, including first and second timing signals, said first timing signals having a frequency which is an integral multiple of said second timing signals;

mode control means settable into either one of two stable states and presenting either a high rate mode signal or a low rate mode signal, alternatively, for respectively designating a high rate sensing mode or a low rate sensing mode;

converter means responsive to the output signal of the inertial sensor for providing a signal manifestation of the direction and the magnitude of the inertial changes being sensed thereby;

an up/down counter;

means responsive to said timing means, said converter means, and said mode control means to apply to said up/down counter either said first timing signals in response to said high rate mode signal or said second timing

signals in response to said low rate mode signal, to count said counter up or down in respective dependence on said signal manifestation of said converter means;

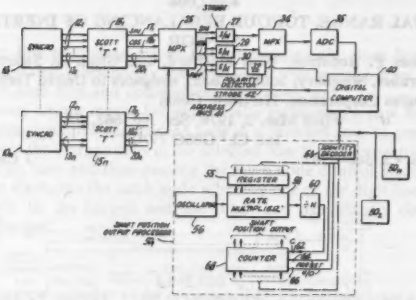
feedback current means responsive to said mode control means and said converter means operable to alternatively provide negative feedback current of either a first magnitude or a second magnitude depending on said mode signals, said first magnitude being said integral multiple of said second magnitude, in either of two polarities in dependence on said signal manifestation of said converter means, to the torque rebalance winding of the inertial sensor; and

means responsive to said converter means for setting said mode control means into one of said states.

4,062,005
SYNCHRO-TO-DIGITAL CONVERTER EMPLOYING COMMON PROCESSING APPARATUS

Gerald Lewis Freed, Highland Park, and David S. Lerner, Fanwood, both of N.J., assignors to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Nov. 4, 1975, Ser. No. 628,471
Int. Cl.² G08C *19/38*
U.S. Cl. 340—198 **12 Claims**



10. In combination in apparatus for providing digital measures of the orientation of a plurality of rotatable shafts, plural shaft position output processor means each for reporting the current position of an associated shaft, said shaft position outputting processor means each including a programmable variable frequency oscillator and a counter connected to the output of said variable frequency oscillator, plural shaft position monitoring means, sampling shaft movement determining means sequentially connected to said plural shaft position monitoring means for controlling the variable frequency oscillator associated with each shaft to perform at a frequency proportional to the rotational rate of that shaft, wherein said programmable variable frequency oscillator in each of said output processing means includes a rate multiplier and pulse source connected to said rate multiplier.

4,062,006
COMBUSTION MONITORING SYSTEM

Fredrick S. Solheim, 555 Arapahoe, and Lee A. Erb, 3565 Catalpa Way, both of Boulder, Colo. 80302

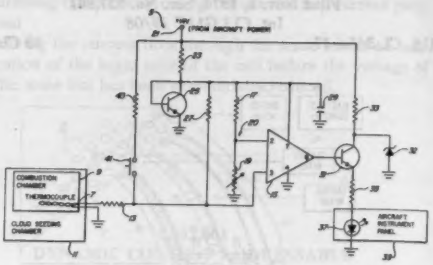
Filed Apr. 26, 1976, Ser. No. 680,023
Int. Cl.² G08B *21/00*
U.S. Cl. 340—228 R **8 Claims**

1. A monitoring system for sensing the combustion state of a combustion chamber of a cloud seeding generator, said monitoring system comprising:

sensing means positioned adjacent to said combustion chamber of said cloud seeding generator and producing an electrical output signal indicative of a predetermined state thereof;

signal processing means for receiving said electrical output signal from said sensing means and providing an output when said signal from said sensing means exceeds a predetermined value;

indicating means connected with said signal processing means to receive the output therefrom and responsive



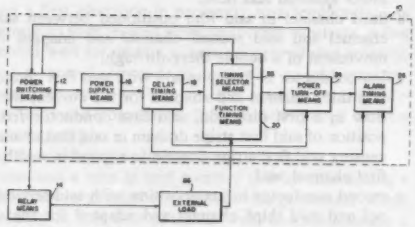
thereto providing an indication of the combustion state of said combustion chamber of said cloud seeding generator; and

testing means connected with said signal processing means for verifying that said system is operable.

4,062,007
SOLID-STATE DELAY TIMED SWITCHING CIRCUIT

Charles E. Scott, Noblesville, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Sept. 17, 1976, Ser. No. 724,346
Int. Cl. G08B *1/00*
U.S. Cl. 340—309.1 **11 Claims**



1. A solid-state delay timed switching circuit comprising, in combination:

a. a power switching means,

b. a power supply means responsive to said power switching means,

c. a single delay timing means electrically coupled to said power supply means for providing a time delay before the start of an operational sequence of functions which includes a first bi-directional semiconductor switch,

d. a function timing means responsive to said delay timing means for timing an operational sequence of functions for predetermined times,

e. a power turn-off means directly responsive to said function timing means for de-energizing said power switching means at the conclusion of the timing cycle of said function timing means which includes a second bi-directional semiconductor switch, and

f. an alarm timing means responsive to said power turn-off means providing an audible alarm at the conclusion of the timing cycle said function timing means for a predetermined time.

4,062,008

SYSTEM FOR SELECTIVE DETECTION AND INDICATION OF IMPACTS UPON A BASE SURFACE

Carl-Eric Waldenburg Carlsson, Eslov, and Göran Solve Holmstedt, Lund, both of Sweden, assignors to Nils Jeppson, Eslov, Sweden

Filed Feb. 9, 1976, Ser. No. 656,684
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—323 R 4 Claims

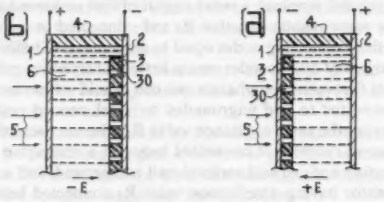
1. A system for selectively detecting and indicating momentary impacts on a base surface, said system comprising at least one detector unit and at least one indicator unit, wherein said detector unit comprises one or more capacitors between the plates of which an elastic material is inserted, the distance between said capacitor plates as well as the dynamic spring rate of the elastic material being adjusted to the type of impact to be detected and to the nature of the base surface, said detector unit being connected to a voltage source via a resistor having a sufficiently high resistance such that the charge on said one or more capacitors remains substantially constant during the duration of the impacts to be detected, and said indicator unit comprises an amplifier connected to the detector unit in such a way that each capacitor in the detector unit actuates the indicator unit, said amplifier amplifying pulses from the detector unit, and a switching means which is connected to the output of the amplifier and which, upon receipt of a pulse from the amplifier, delivers a signal to at least one indicator means for a desired time.

4,062,009

ELECTROPHORETIC DISPLAY DEVICE

Yvan Raverdy, and Jean Luc Ploix, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed July 13, 1976, Ser. No. 704,905
Claims priority, application France, July 17, 1975, 75.22353
Int. Cl.[2] G06F 3/14; G09F 9/32
U.S. Cl. 340—324 R 14 Claims



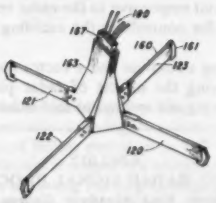
1. A display device using electrophoresis, comprising two substrates, a front substrate disposed towards incident light and a back substrate, said substrates carrying electrodes, at least said front substrate and its electrodes being transparent, said substrates being substantially parallel and attached together in order to form a closed vessel filled with a resistive fluid; said display device further comprising a thin electrophoretically displaceable diaphragm arranged in said vessel and permeable to said fluid, said diaphragm being capable of scattering the incident light in a colour differing from that of said fluid; means for applying a potential difference between at least one electrode on said front substrate and at least one electrode on said back substrate, thus developing an electric field between said substrates thereby making at least part of the diaphragm to apply on one of the two substrates in accordance with the direction of said electric field, said incident light being scattered when said diaphragm is applied on said front substrate, and being substantially absorbed by said fluid when said diaphragm is applied on said back substrate.

4,062,010

UNDERGROUND PIPE DETECTOR

Jonathan D. Young, Worthington, and Ross Caldecott, Columbus, both of Ohio, assignors to The Ohio State University, Columbus, Ohio

Division of Ser. No. 665,924, March 11, 1976, Pat. No. 4,028,707, which is a continuation-in-part of Ser. No. 437,927, Jan. 30, 1974, Pat. No. 3,967,282. This application Mar. 7, 1977, Ser. No. 775,383
The portion of the term of this patent subsequent to June 7, 1994, has been disclaimed.
Int. Cl.[2] H01Q 1/04, 21/26
U.S. Cl. 343—5 NA 7 Claims



1. In a system for detecting and identifying targets situate beneath the surface of the ground where generating means serves to generate discrete pulses of short duration for effecting broad spectrum electromagnetic radiation and apply said pulses through input terminals to antenna means, said system further including means including output terminals for receiving and operating, in time domain fashion, upon pulse reflection detected by said antenna means, the improvement comprising:

a composite antenna including:

a pair of axially aligned oppositely extending nonresonant transmitting arms, each said arm being electrically coupled with the feed component of a said input terminal;

a second pair of axially aligned oppositely extending nonresonant receiving arms, each said arm being electrically coupled with the feed component of a said output terminal, said second pair of arms being arranged in orthogonal axial relationship with the axis of said transmitting arms;

each said pair of transmitting and receiving arms being configured having wave energy absorbing characteristics minimizing pulse reflection developed within said antenna, and each said arm thereof extending from a respective said feed component coupling to terminate in symmetry at a common mutual connection; and

said composite antenna being configured to operate at locations closely proximate the said ground surface to enhance the coupling of electromagnetic energy between said antenna and the ground.

4,062,011

MTI SYSTEM PROCESSOR AND METHOD

Glenn W. Preston, Rosemont, Pa.; Walter H. Chudleigh, Jr., Golden Valley, Minn., and William G. Ehrich, Geneva, Switzerland, assignors to Control Data Corporation, Minneapolis, Minn.

Filed Aug. 21, 1972, Ser. No. 282,073
Int. Cl.[2] G01S 9/42
U.S. Cl. 343—7 A 11 Claims

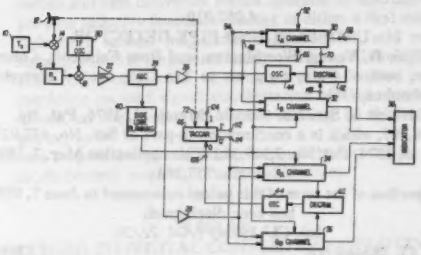
1. An MTI system comprising:

a source of pulse radar return signals;

an indicator;

a signal processor for processing the radar return signals

from said source, said processor including in-phase and quadrature channels each having a blanking gate operative when enabled to apply the processed radar signals to said indicator;



a blanking circuit responsive to the radar return signals from said source for controlling the enabling of said blanking gates; and,

means including a resolver and a vector rotator for substantially removing the effects of radar platform from the radar return signals applied to said blanking gates.

4,062,012

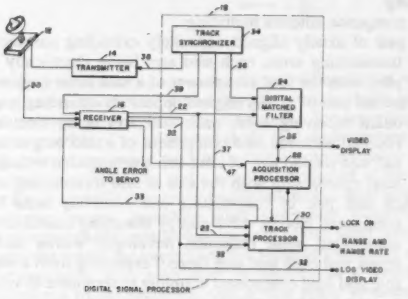
DIGITAL RADAR SIGNAL PROCESSOR

Richard P. Colbert, East Meadow; George Dimitriou, East Northport; Max E. Jones, Northport, and Jack I. Haberman, Plainview, all of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 487,513, July 11, 1974, abandoned. This application Apr. 30, 1976, Ser. No. 681,997

Int. Cl.[2] G01S 9/14

U.S. Cl. 343—7 A **9 Claims**



1. A digital signal processor for use with a radar receiver, comprising:

an adaptive constant false alarm threshold loop connected to receive signal returns from said radar receiver for producing a signal indicative of a target,

memory means connected to receive said signal indicative of a target for storing said signal and updating said signal in accordance with successive signals indicative of a target and producing a digital word indicative of said target,

an adaptive background average threshold loop connected to receive said digital word indicative of said target for comparing said word with selected words which precede and follow said word in time and for producing an output signal declaring a target if said word exceeds said selected words,

a track signal processor having a first input connected to a track loop signal and a second input connected to receive said output signal from said adaptive background average threshold loop for providing digital range and velocity signals, and

an error word generator connected to receive said digital range and velocity signals from said track signal processor for producing an error word signal which is fed back to said first input of said track signal processor for closing a track signal loop.

4,062,013

NON-LINEAR TYPE DIGITAL-TO-ANALOG CONVERTER

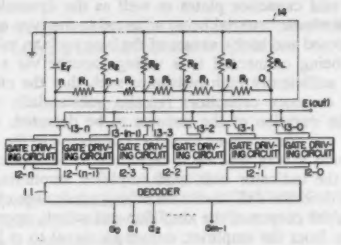
Yasuo Nagahama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Oct. 20, 1975, Ser. No. 624,187

Claims priority, application Japan, Oct. 24, 1974, 49-121957

Int. Cl.[2] H03K 13/02

U.S. Cl. 340—347 DA **5 Claims**



1. A non-linear type digital-to-analog converter for producing an exponential function output having, as its exponent, a value corresponding to an input digital signal applied thereto, comprising

a. decoder means, having a plurality of inputs for receiving digital input signals and individual output ports for developing individual output signals, for decoding said digital input signal to develop an individual output signal corresponding to an applied digital input signal;

b. exponential function generating means, comprising a DC voltage source having a grounded terminal and an ungrounded terminal, a series circuit of first resistors having the same resistance value R_1 and connected in series to define connecting nodes equal to the number of individual outputs of said decoder means between respective pairs of said first resistors, wherein one end of said series circuit is connected to said ungrounded terminal, second resistors having the same resistance valve R_2 wherein each of said second resistors is connected between a respective connecting node of said series circuit and ground, and a third resistor having a resistance value R_L connected between another end of said series circuit and ground, wherein said first second and third resistors having values satisfying the equation $R_2 = R_L(1+(R_L/R_1)$ for providing at respective ones of said connecting nodes analog outputs of stepwise exponentially differing values; and

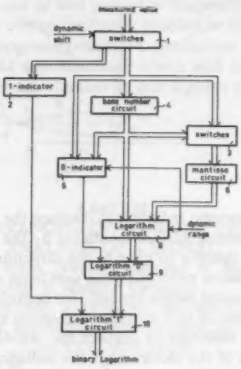
c. control switching means including a common output terminal and comprising a plurality of control switching circuits connected respectively to said connecting nodes of said exponential function generating means and to said individual outputs of the decoder so that, in response to an individual analog output of said decoder means, said analog outputs provided at said output points of said exponential function generating means are selectively applied to said common output terminal in accordance with the applied digital input signal.

4,062,014

NATURAL BINARY TO LOGARITHMIC BINARY CONVERSION DEVICE WITH MEANS FOR RANGE SELECTION

Ulf Rothgordt, Norderstedt; Bernd Ehlers, Tornesch; Ernst Bunge, Hamburg, and Herbert Piotrowski, Kaltenkirchen, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 30, 1976, Ser. No. 653,922
Claims priority, application Germany, Feb. 8, 1975, 2505388
Int. Cl.[2] H03K *13/24*
U.S. Cl. 340—347 DD 1 Claim



1. A device comprising

an input for supplying a binary number to be converted into a binary logarithm;

switch means having a control input for shifting the input number in parallel a predetermined number of bit positions, and having a binary valued output;

a 1-indicator connected to the output of said switch means for producing a signal if at least one bit on said output of said switch means has a "1" value;

a base number circuit connected to the output of said switch means for forming the base number of said binary number, and having an output;

a mantissa circuit connected to the output of said switch means for forming the mantissa of said binary number, and having an output;

a 0-indicator connected to the output of said switch means for producing a signal if all bits of said base number have a "0"-value, and the bit of the least significant position of the dynamic range also has the value "0";

a logarithm circuit, connected to the output of said base number circuit and said mantissa circuit for selecting the magnitude of the dynamic range, the output of the least significant position of the base circuit directly adjoining the output for the most significant position of the mantissa circuit, and having an output representing the binary logarithm;

a logarithm 0-circuit connected to the output of said logarithm circuit and said 0-indicator for producing a 0-value binary number output when the 0-indicator indicates that the base number has the value "0"; and

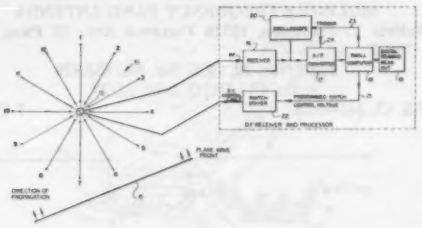
a logarithm 1-circuit connected to the output of said 0-circuit and said 1-indicator for producing a binary number with the value "1" in each bit position if the 1-indicator indicates a 1-value.

4,062,015

RAPID AZIMUTHAL DETERMINATION OF RADIO SIGNALS

John Litva, 256 Union Street, Almonte, Ontario, Canada (K0A 2C0), and Everett Earle Stevens, 113 Marina Drive, Manotick, Ontario, Canada

Filed Jan. 30, 1976, Ser. No. 654,018
Claims priority, application Canada, Jan. 30, 1975, 219067
Int. Cl.[2] G01S *3/20, 3/58*
U.S. Cl. 343—120 7 Claims



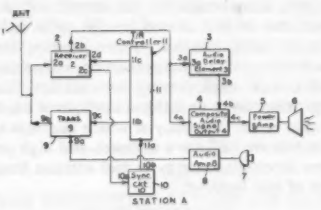
1. A method of determining the bearing of a radio signal comprising sequentially scanning, in a time period short compared to the typical fading period of an HF signal, a plurality of directional antennas arranged in a rosette array to determine which antenna is receiving the largest amplitude signal which indicates the approximate bearing of the radio signal, and making comparisons of said largest amplitude signal with the signal amplitudes of two adjacent antennas in the array, said comparisons being indicative of the amount and direction that the bearing of the radio signal differs from said approximate bearing.

4,062,016

SIMULTANEOUS TELECOMMUNICATION BETWEEN RADIO STATIONS

Katsutaka Kotezawa; Toshimi Onodera; Setsuo Hayashi, and Fujio Shimanuki, all of Funabashi, Japan, assignors to Chiba Communications Industries, Inc., Japan

Filed Jan. 5, 1976, Ser. No. 646,475
Claims priority, application Japan, Jan. 11, 1975, 50-16272; Feb. 14, 1975, 50-17087
Int. Cl.[2] H04B *1/56*
U.S. Cl. 343—178 14 Claims



14. In a radio communication system for effecting simultaneous telecommunication between a first and a second station each including a transmitter and a receiver and using a carrier of a single frequency which carries audio signals, at least one of said stations comprising first means for providing a pulse train comprised of a series of time division pulse signals, each of which pulse signals occurs in a predetermined time interval, said pulse signals of said pulse train having a repetition frequency which is within the audio frequency range, controller means for enabling said receiver to output the audio signals received during the interval of certain ones of said pulse signals in said series, output means for said receiver over which said audio signals are provided, delay means connected to said output means for delaying said audio signals for one time

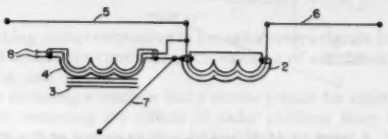
interval, and composite signal means connected to said output means and said delay means for providing a composite signal comprised of the audio signals output by said receiver in one time interval followed by the same audio signals as delayed by said delay means, whereby two sets of identical audio signals appear successively as a composite signal, and means for coupling said composite signal to audio reproducing means for reproduction purposes.

4,062,017

MULTIPLE FREQUENCY BAND ANTENNA

Wallace T. Thompson, 10528 Tomwood Ave., El Paso, Tex. 79925

Filed Nov. 20, 1975, Ser. No. 633,928
Int. Cl.² H01Q *1/14, 21/28*
U.S. Cl. 343—722 **7 Claims**



1. A multiple frequency band antenna for coupling to a feedline comprising:
a high permeability core;
a coaxial network including
first and second input terminals for connection to said feedline, and
first and second coaxial cables each comprising an electrically conductive shield having first and second ends and a center conductor having first and second ends, said first coaxial cable being wrapped about said high permeability core and having the first end of its center conductor and its shield connected to said first and second input terminals, the second end of the center conductor of said first coaxial cable being connected to the first end of the center conductor of said second coaxial cable, the conductive shields of said first and second coaxial cables being connected together; and
first, second and third conductive radiation elements, said first element being coupled to the junction between the first and second ends of the center conductors of said first and second coaxial cables respectively, said second element being coupled to the second end of the center conductor of said second coaxial cable and said third element being coupled to the junction between the shields of said first and second coaxial cables, said second coaxial cable having an electrical length equal approximately to an integral multiple of one-half wavelengths at the frequency at which said first and second elements are half-wave resonant, said high permeability core decoupling energy in said antenna from the exterior of said feedline.

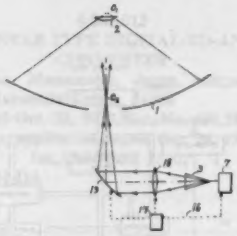
4,062,018

SCANNING ANTENNA WITH MOVEABLE BEAM WAVEGUIDE FEED AND DEFOCUSING ADJUSTMENT

Hiroshi Yokoi, Machida, and Masatsku Akagawa, Yokohama, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Continuation of Ser. No. 533,800, Dec. 18, 1974, abandoned.
This application Aug. 11, 1976, Ser. No. 713,590
Claims priority, application Japan, Dec. 21, 1973, 48-142384
Int. Cl.² H01Q *3/12, 19/14*
U.S. Cl. 343—754 **9 Claims**

1. An aperture antenna, comprising:
a. a fixed main parabolic reflector having a parabolic reflecting surface;
b. a primary radiator for radiating electromagnetic radiation;
c. a pair of movable auxiliary parabolic reflectors positioned between said main reflector and said primary radiator for reflecting electromagnetic radiation from said primary radiator along a path towards the parabolic reflecting surface of said main reflector, one of said auxiliary reflectors being positioned closer to said main reflector than the other of said auxiliary reflectors;
d. first control means operable for controlling the position of the closer one of said auxiliary reflectors along the path of



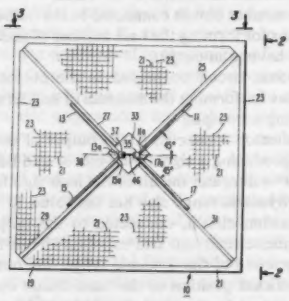
electromagnetic radiation to displace the area of the parabolic reflecting surface irradiated by the electromagnetic radiation thereby to change the direction of electromagnetic radiation reflected from said main reflector; and
e. second control means operable for controlling the position of the other of said auxiliary reflectors to displace it in a direction effective to correct for wavefront defocusing distortion of the electromagnetic radiation reflected from said main reflector caused by the displacement of said closer one of said auxiliary reflectors.

4,062,019

LOW COST LINEAR/CIRCULARLY POLARIZED ANTENNA

Oakley McDonald Woodward, Princeton, and Matti Solmu Olavi Siukola, Westmont, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 2, 1976, Ser. No. 672,859
Int. Cl.² H01A *21/26*
U.S. Cl. 343—797 **5 Claims**



1. An antenna system operating over a given band of frequencies comprising:
a flat reflective panel,
support means including a pair of separated support members extending generally orthogonal to said panel,
a first pair of generally orthogonally oriented conductive elements joined together at one end to one of said support members a distance of about one-quarter wavelength at a given frequency within said given band of frequencies from said panel, at least one of said elements being at least

about one-quarter wavelength long at said given frequency,

a second pair of generally orthogonally oriented conductive elements joined together at one end to the other of said support members about said distance from said panel, at least one of said elements being at least about one-quarter wavelength long at said given frequency, each one of said pair of elements in said first pair extending in generally an opposite direction from one of the conductive elements in said second pair of elements, each of said conductive elements being inclined toward said reflective panel with each of said conductive elements having a conductive loading rod connected across the free end thereof, and

a coaxial transmission line feed having an outer conductor coupled to one of said pair of orthogonally oriented elements and a center conductor coupled to the other of said pair of orthogonally oriented conductive elements at a point located approximately where said conductive elements are joined together to said support members.

4,062,020

CIRCUIT ARRANGEMENT FOR THE FREQUENCY ANALYSIS OF A SIGNAL

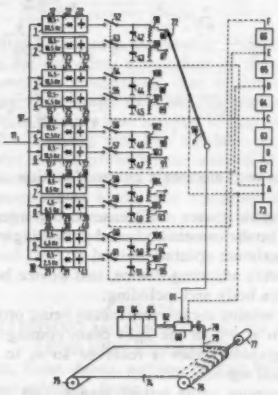
Kurt Berglund, Solna, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 5, 1976, Ser. No. 664,414

Claims priority, application Germany, Mar. 24, 1975, 2512939

Int. Cl.² G01R *23/18*

U.S. Cl. 346—33 R **8 Claims**



1. In a circuit arrangement for the frequency analysis of a signal, including a plurality of band filter channels having inputs to which the signal is transmitted in parallel connection, said channels including band filters of different boundary frequencies, rectifiers and integrators for integrating the rectified output signals of the band filters within predetermined integrating intervals; and a scanning installation being connected to the outputs of the latter for retrieving the integrating results after predetermined intervals, the improvement comprising: means comprising switch elements for determining the integrating intervals in dependence upon the median transmissive frequencies of said band filters so that the integrating intervals decrease with an increasing median transmissive frequency of said band filters; and switch elements having correlating means connected to the outputs of said integrators for correlating each integrating result to the corresponding integrating interval.

4,062,021

INK RECORDER WITH GROOVED PRESSURE ROLLER FEED

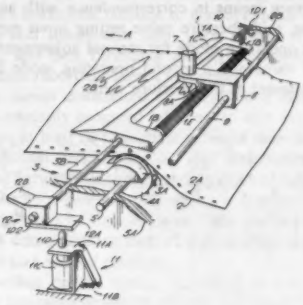
Leonard Harold Taylor, Loudwater, England, assignor to Perkin-Elmer Limited, Beaconsfield, England

Filed Sept. 10, 1976, Ser. No. 722,191

Claims priority, application United Kingdom, Sept. 12, 1975, 37511/75

Int. Cl.² G01D *15/24*; G03B *1/24*

U.S. Cl. 346—136 **13 Claims**



1. An improved strip chart recorder comprising, in combination:

a platen with a smooth arcuate surface;

a strip chart;

a chart advancing means coupled to said strip chart to advance said strip chart over said platen in a forward direction;

a wet-ink recorder pen mounted for rectilinear motion longitudinally of said platen;

a pressure roller disposed adjacent said platen and upstream of said recorder pen with reference to said forward direction with said strip chart passing between said roller and said platen, said roller being non-yielding under pressure and having a plurality of longitudinally extending grooves in the surface of said roller, each of said grooves being separated from adjacent grooves by a narrow crest, each said groove having a length sufficient to extend over the entire working surface of said chart; and

means to support said roller adjacent said platen permitting free rotation thereof about its rotation axis and selectively urge said roller either towards or away from said platen with said strip chart disposed therebetween, said roller being urged toward said platen when said chart is advanced in said forward direction by said advancing means and urged away from said chart when said chart is not being advanced.

4,062,022

DEVICE FOR PREVENTING ERRONEOUS HANDLING OF A CAMERA

Hiroyashu Murakami, Tokyo; Tadashi Ito, Yokohama; Fumio Ito, Yokhama; Nobuaki Sakurada, Yokohama; Mashaharu Kawamura, Hino, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1975, Ser. No. 623,370

Claims priority, application Japan, Oct. 18, 1974, 49-119939

Int. Cl.² G03B *7/08*

U.S. Cl. 354—38 **10 Claims**

1. A dual preference camera capable of effecting shutter time priority and aperture value priority comprising:

a. shutter means;

b. shutter control means functionally engaged with said shutter means;

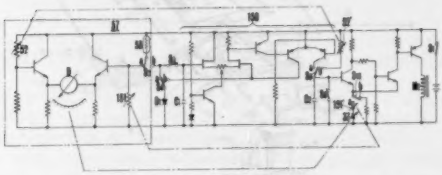
c. shutter time setting input means functionally engageable

with said shutter control means for controlling said shutter means during an opening time of said shutter means corresponding to a set value, said shutter time setting input means having a first operating mode for manual adjustment of the shutter time and a second operating mode for automatic adjustment of the shutter time;

d. aperture means;

e. aperture control means functionally engageable with said aperture means;

f. aperture value setting input means, functionally engageable with said aperture control means for controlling said aperture means in correspondence with an aperture set value, said aperture value setting input means having a first operating mode for manual adjustment of the aperture value and a second operating mode for automatic adjustment of the aperture value;



g. exposure control means to effect a desired exposure time including light measuring means for measuring object brightness, said exposure control means being operatively connected to said shutter control means and said aperture control means to control said shutter means and said aperture means in accordance with signals from said shutter time setting input means, said aperture value setting input means and said light measuring means; and

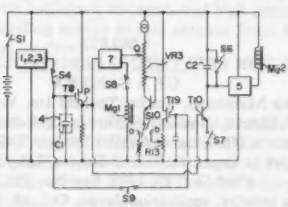
h. means for preventing erroneous handling of said camera, said erroneous handling preventing means being connected to said shutter time setting input means and said aperture value setting input means so that only when both said means are set in the automatic adjustment modes, the actuation of the shutter release of the camera is prevented.

4,062,023

EXPOSURE CONTROL DEVICES FOR PHOTOGRAPHIC CAMERAS

Toshio Kobori, Sakai; Kayoshi Tsujimoto, Osaka; Yasuhiro Nanba, and Seiji Yamada, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 486,427, July 8, 1974, Pat. No. 3,964,073. This application Apr. 6, 1976, Ser. No. 674,721
Claims priority, application Japan, July 17, 1973, 48-81089
Int. Cl.[2] G03B 7/08
U.S. Cl. 354—38 **8 Claims**



1. An exposure control device for a photographic camera having an objective lens and a diaphragm, comprising:

diaphragm controlling means movable from an initial to a terminal position for varying the aperture size of said diaphragm;

means for measuring the scene light transmitted through said objective lens and diaphragm to generate a first electrical signal in accordance with the intensity of the light transmitted through said objective lens and diaphragm;

means for producing a second electrical signal in accordance with a linear function of said first electrical signal;

means for determining an operative position at which said diaphragm controlling means is stopped in accordance with the difference between said first and second electrical signals appearing with said diaphragm controlling means at said initial position; and

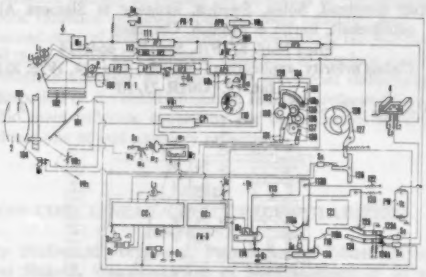
means for controlling the exposure time in accordance with said first electrical signal appearing with said diaphragm controlling means at said operative position.

4,062,024

CONTROL SYSTEM CONSISTING OF SEMI-CONDUCTOR INTEGRATED CIRCUITS FOR A CAMERA

Tokuichi Tsunekawa; Masanori Uchidoi, both of Yokohama; Masami Shimizu, Tokyo; Masayoshi Yamamichi, Kawasaki; Keiya Murayama, Fukushima, and Hiroshi Aizawa, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 30, 1975, Ser. No. 618,125
Claims priority, application Japan, Oct. 4, 1974, 49-114835
Int. Cl.[2] G03B 7/00
U.S. Cl. 354—60 R **12 Claims**



1. A camera with electronic control function comprising:

A. a camera body;

B. photographic lenses, said lenses being interchangeably mounted on the camera body and presenting certain determined maximum aperture values;

C. an exposure adjusting device, said device being built in the camera body and including:

a. a light sensing means, said means being provided at the position at which the light beam coming through the photographic lenses is received so as to produce an electrical signal,

b. an exposure value setting means, said means setting other set exposure informations than the exposure informations to be adjusted so as to produce an electrical signal,

c. an exposure measuring circuit, said circuit including an input to be connected to the light sensing means, an output and a first current supply input and being composed as a first integrated circuit,

d. an exposure operation circuit, said circuit including an input to be connected to the exposure value setting means and an input to be connected to the exposure measuring circuit and a second current supply input for said circuit to operate effectively,

e. an exposure control circuit, said circuit including an input to be connected to the output of the exposure operation circuit, an output for giving an output signal corresponding to the exposure information value to be adjusted and a third current supply input for said circuit to operate effectively,

f. an exposure determining means, said means being func-

tionally engaged with the photographic lenses so as to restrict the light beam passing through the lenses further said means including an electromagnetic means functionally engaged with the exposure control circuit; and

D. a current supply control circuit, said circuit being built in the camera body and including a current supply output for supplying the current to the first, the second and the third current supply input in functional engagement with the actuation of the camera body and further including a signal producing circuit for supply current to the third current supply input later than the first and the second current supply input.

4,062,025

METHOD AND APPARATUS FOR MICROFORM UPDATING

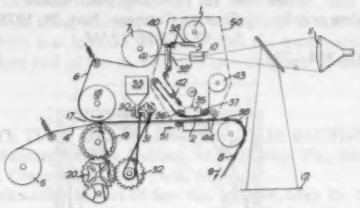
Harry Arthur Hele Spence-Bate, 1 Cheam Place, Morley, Australia (6062)

Filed May 13, 1976, Ser. No. 685,994

Claims priority, application Australia, May 15, 1975, 1613/75

Int. Cl.[2] B29C *19/00*; **B32B** *31/00*; **B60J** *1/00*; **G03B** *29/00*

U.S. Cl. 354—76 **14 Claims**



10. Apparatus for microform updating comprising a microform camera for recording a sequence of images on a film emulsion, means for moving said film emulsion retained on permanent carrier material to a transfer station, means for feeding a strip of primary base material to said transfer station and means for applying said film emulsion and permanent carrier material to said primary base material at said transfer station, said means for applying a plunger having an interconnected and surrounding blade, said blade adapted to cut an image-carrying frame from said film emulsion and said plunger being adapted to remove said frame and bond said carrier material to said primary base material.

4,062,026

DATA RECORDING MEANS FOR USE IN A SINGLE LENS REFLEX CAMERA

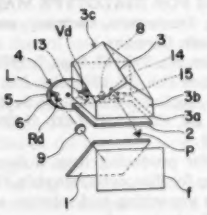
Susumu Fujita, Kobe, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 15, 1976, Ser. No. 723,344

Claims priority, application Japan, Oct. 28, 1975, 50-130065; Feb. 17, 1976, 51-16637

Int. Cl.[2] G03B *17/24*

U.S. Cl. 354—106 **7 Claims**



1. In a camera comprising a taking lens assembly, shutter means and a viewfinder system including a mirror which is normally disposed at an angle of 45° with respect to the optical axis of said taking lens system and positioned between said taking lens system and the frame of a film located at an exposure station and for directing image-wise light reflected from an external scene upwards to and through a focussing screen and into a pentaprism, said pentaprism having lower and rear surfaces which are transparent, and having at least the major portions of the other surfaces externally silvered and which causes said image-wise light to be directed to the eye-lens of the viewfinder system, and means for moving said mirror temporarily to a horizontal position to permit exposure of said film frame to said image-wise light upon actuation of said shutter means, and data recording means, the improvement wherein said data recording means comprises:

data carrier means constituted by at least one disk means which is rotatably mounted adjacent to said pentaprism and defines at least two identical series of data items, the same positional relationship on said disk means being maintained between all corresponding items of data in said series whereby when said disk means is rotated to bring one of said items of data in one of said series to a first position, a corresponding item of data in other said series is brought to a second position;

a data recording optical system including at least a lens means for focussing on said film frame the image of a data item positioned at said first position; and

a data viewing optical system which directs the image of a data item at said second position from said second position along an optical path which lies forward of the base portion of said pentaprism, through a small transparent portion in the lower front surface of said pentaprism, and through said pentaprism to said eye-lens.

4,062,027

DATA EXPOSURE DEVICE FOR CAMERA

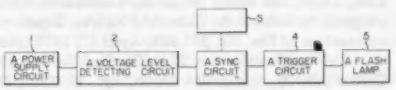
Kazuo Miyazaki, Kawasaki, and Sachio Ohmori, Yokohama, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 1, 1975, Ser. No. 563,955

Claims priority, application Japan, Apr. 9, 1974, 49-39786[U]

Int. Cl.[2] G03D *15/02*

U.S. Cl. 354—127 **5 Claims**



1. A data exposure device for a camera by which a desired data is exposed to a film by igniting a flash lamp, comprising:

a. a main flash capacitor for applying a charged voltage to the flash lamp;

b. a voltage detecting element which becomes conductive when the voltage across the main flash capacitor reaches a predetermined level sufficient to cause the flash lamp to generate a proper light quantity;

c. a synchro switch adapted to be closed when a shutter of the camera is released;

d. switch means connected to both the voltage detecting element and the synchro switch, the switch means generating an output due to closure of the synchro switch only when the voltage detecting element is conductive;

e. a trigger circuit actuated by said output, the flash lamp being triggered by actuation of the trigger circuit; and

f. a synchro terminal connected in parallel with the synchro switch.

4,062,028
SINGLE REFLEX CAMERA

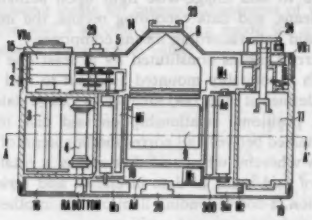
Nobuo Tezuka, Tokyo; Masanori Uchidoi, Kawasaki; Yukio Iura, Yokosuka; Satoshi Watanabe, Inagi; Masayoshi Yamamichi, Kawasaki, and Hiroshi Aizawa, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 7, 1975, Ser. No. 593,301

Claims priority, application Japan, July 9, 1974, 49-78494; July 9, 1974, 49-78495; July 17, 1974, 49-83061; July 17, 1974, 49-83062

Int. Cl.[2] G03B *19/12, 17/00, 9/02*

U.S. Cl. 354—152 4 Claims



1. A single lens reflex camera, comprising a camera body having a top wall and a bottom wall, and a mirror box in the camera body, a shutter assembly embracing the mirror box, shutter driving means mounted in said camera body, mirror lifting means mounted in said camera body, automatic diaphragm control means disposed between the mirror box and the bottom wall of the camers body, and an electromagnetic release means having a mechanical output coupled to said automatic diaphragm control means, said automatic diaphrgam control means and said mirror lifting means and said shutter driving means being coupled to each other so that said diaphragm control means and said lifting means and said shutter driving means are initiated in succession in response to said release means, said electromagnetic release means being located in a space above the bottom wall of the camera body and below the level of the mirror box.

4,062,029
LENS SHUTTER ACTUATING DEVICE FOR QUICK-RETURN TYPE SINGLE-LENS REFLEX CAMERA

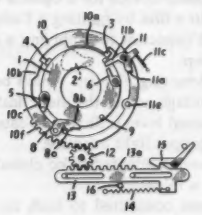
Kiyoshi Kitai, Tokyo; Yukio Nakamura, Yotsukaido; Shogo Kato, Daiei, and Shinji Nagaoka, Yotsukaido, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Continuation of Ser. No. 461,805, April 17, 1974, abandoned. This application Jan. 27, 1976, Ser. No. 652,815

Claims priority, application Japan, Apr. 19, 1973, 48-43652

Int. Cl.[2] G03B *9/00, 9/08*

U.S. Cl. 354—232 2 Claims



1. In a lens shutter for a quick-return type single lens reflex camera, shutter blades, a single shutter-operating ring for closing and opening the shutter for focusing independently of an exposure operation and for taking of an exposure, driving means for rotating the shutter-operating ring in one direction for closing the shutter blades and reopening the shutter blades for taking an exposure, a signal lever continuously free of said shutter-operating ring rotatable when an exposure is completed, a stop lever pivotally mounted at a fixed point in the vicinity of said shutter-operating ring stopping the rotation of the shutter-operating ring after said shutter-operating ring releases the shutter and opens the shutter blades for taking an exposure, said stop lever being disposed for engaging said signal lever and being locked thereby holding the shutter-operating ring stopped until an exposure is completed, a pin on said shutter-operating ring for engaging said stop lever and camming it in a direction for directly engaging said signal lever and being held thereby for precluding rotation of said shutter-operating ring until release of said stop lever by said signal lever, and when an exposure is completed said signal lever is rotated and releases said stop lever effective to release said pin allowing continued rotation of said shutter-operating ring in said one direction for reopening the shutter blades.

4,062,030
INTERCHANGEABLE LENS RETAINING MEANS FOR PHOTOGRAPHIC CAMERAS

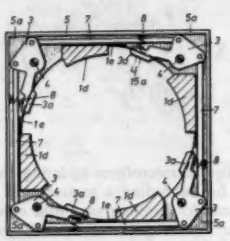
Franz Stamp, Wildbad, Germany, assignor to Carl Zeiss Stiftung, Oberkochen, Germany

Filed Nov. 18, 1976, Ser. No. 742,855

Claims priority, application Germany, Nov. 29, 1975, 2553861

Int. Cl.[2] G03B *17/14*

U.S. Cl. 354—286 10 Claims



1. Retaining means for detachably coupling a lens to a camera upon axial movement without rotary movement of the lens relative to the camera, said retaining means comprising radially extending flange means on said lens, said flange means having a front face and a rear face, latch means mounted on said camera for movement having a radial component between a latching position engaging said front face when said lens is seated on said camera to hold said lens against removal therefrom and an unlatching position disengaged from said front face, spring means tending to move said latching means toward its latching position, and latch releasing means mounted on said lens for shifting said latch means from its latching position to its unlatching position to permit removal of said lens from said camera.

4,062,031
APPARATUS FOR PRODUCING A DEVELOPER MEDIUM FOR DIAZOTYPE MATERIALS

Herbert Schröter, Taunusstein, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 395,153, Sept. 7, 1973, abandoned. This application Feb. 26, 1976, Ser. No. 661,575

Claims priority, application Germany, Sept. 9, 1972, 2244422

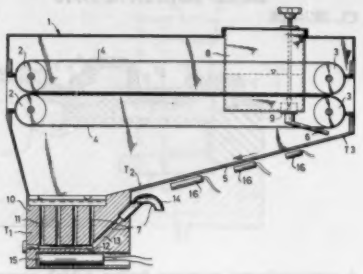
Int. Cl.[2] G03D *7/00, 13/00*

U.S. Cl. 354—299 3 Claims

1. Apparatus for producing from a developer solution a gaseous developer for diazotype materials, the apparatus comprising means for vaporizing said solution, said means having an upper end and a lower end,

inlet and outlet means for said solution, said outlet means comprising a siphon with a descending, ascending and

finally again descending portion, said siphon comprising a block of thermally conductive material having a plurality of downwardly extending bores therethrough, the lower end of each of the bores opening into a common collecting channel, and said downwardly extending bores opening



into said collecting channel forming at least a part of the first descending portion of said siphon,

and electrical heating means for said siphon, said heating means being adapted to heat the siphon to a temperature which is at least 25° C higher than the temperature at the upper end of the means for vaporizing said solution.

4,062,032

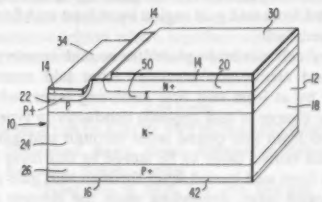
GATE TURN OFF SEMICONDUCTOR RECTIFIERS

John Manning Savidge Neilson, Mountaintop, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 364,664, May 29, 1973, abandoned. This application May 27, 1975, Ser. No. 580,771

Int. Cl.[2] H01L *29/90*

U.S. Cl. 357—13 **13 Claims**



1. A gate controlled rectifier comprising:

a body of semiconductor material including two emitter regions and two base regions, each base region being disposed between an emitter region and the other of said base regions, adjacent regions being of opposite type conductivity and having a PN junction therebetween

a gate electrode connected to one of said base regions, and

means for increasing the avalanche breakdown capability of said rectifier for voltages applied between said one base region and the emitter region adjacent thereto, said means comprising:

a. a layer of semiconductor material of the same conductivity type as that of said adjacent emitter region between said one base region and said adjacent emitter region, in which the average concentration of dopant atoms of each conductivity type, including both the compensated and uncompensated atoms thereof, is less than the maximum concentration of the majority type dopant atoms in said one base region, and

b. said layer having a thickness adequate to increase said avalanche breakdown capability to a voltage greater than the voltage drop through said one base region caused by the diversion of current within said one base region from said adjacent emitter region to said gate electrode said current being generated by a turn-off voltage applied to said gate electrode.

4,062,033

SCHOTTKY BARRIER TYPE SEMICONDUCTOR DEVICE

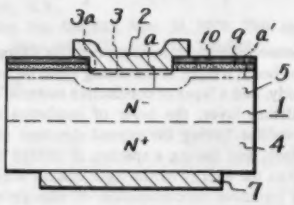
Kunizo Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 9, 1976, Ser. No. 675,630

Claims priority, application Japan, Apr. 25, 1975, 50-50435

Int. Cl.[2] H01L *29/48, 29/34, 29/40*

U.S. Cl. 357—15 **5 Claims**



1. A Schottky barrier type semiconductor device comprising: a semiconductor substrate having a predetermined impurity concentration, an electrode formed on said semiconductor substrate in ohmic contact therewith, a metal contact on a surface of said substrate which forms a Schottky barrier with said semiconductor substrate, and a polycrystalline silicon layer containing oxygen atoms in the range between 2 and 45 atomic percent on said surface of said substrate; said polycrystalline silicon layer extending on said surface at least up to the corner which the peripheral portion of said metal contact makes with said surface of said substrate whereby said surface of said semiconductor substrate is stabilized, and the breakdown of said barrier is prevented.

4,062,034

SEMICONDUCTOR DEVICE HAVING A HETERO JUNCTION

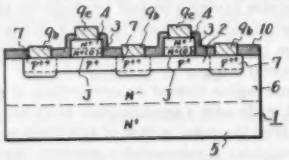
Takeshi Matsushita, Sagamihara; Hisao Hayashi, Atsugi, and Mitsuru Shibasaki, Hatano, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 23, 1976, Ser. No. 679,846

Claims priority, application Japan, Apr. 30, 1975, 50-52731

Int. Cl.[2] H01L *29/161*

U.S. Cl. 357—16 **9 Claims**



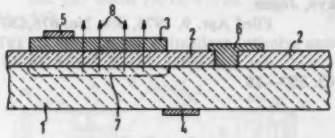
1. A semiconductor device comprising a semiconductor region of a predetermined conductivity type, a polycrystalline or amorphous silicon layer containing oxygen and of a predetermined conductivity type on said region and forming a hetero junction therewith, and means for supplying an electrical current through said junction.

4,062,035

LUMINESCENT DIODE

Guenter Winstel, Ottobrunn, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 654,786, Feb. 3, 1976. This application Jan. 28, 1977, Ser. No. 763,548
Claims priority, application Germany, Feb. 5, 1975, 2504775
Int. Cl.² H01L *33/00*
U.S. Cl. 357—17 13 Claims



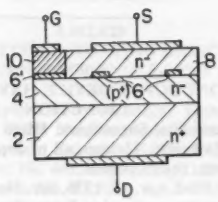
1. A semiconductor luminescent diode comprising a semiconductor body, a layer of insulating material on this semiconductor body, and a layer of conductive material arranged upon said insulating layer, the layer of insulating material being monocrystalline having the crystal structure of the semiconductor body, and having a spacing of energy bands which is greater than the energy of the light quanta which are emitted during a radiative recombination of charge carriers in the semiconductor body.

4,062,036

JUNCTION FIELD EFFECT TRANSISTOR OF VERTICAL TYPE

Takashi Yoshida, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 4, 1975, Ser. No. 565,261
Claims priority, application Japan, Apr. 6, 1974, 49-38471
Int. Cl.² H01L *29/80, 29/06*
U.S. Cl. 357—22 8 Claims



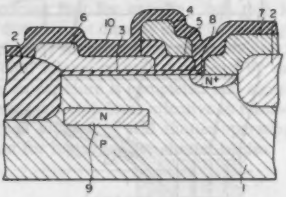
1. A vertical-type junction field effect transistor comprising:
a drain region provided on a highly doped semiconductor substrate having a certain conductivity type and made of a semiconductor body having a conductivity type the same as that of said substrate and having a low impurity concentration,
a source region formed on one surface of said drain region and made with a semicondutor body having a conductivity type the same as that of said drain region and having throughout a substantially constant impurity concentration not lower than that of the drain region, and
a gate region provided at the intersurface between said drain region and said source region and having a conductivity type opposite to the conductivity type of said drain region and source region,
said gate region being formed on the surface of said drain region between said drain and said source regions and protruding only into said source region.

4,062,037

SEMICONDUCTOR MEMORY DEVICE

Ryoiku Togei; Akira Takei, and Kunihiko Wada, all of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

Filed Apr. 15, 1976, Ser. No. 677,130
Claims priority, application Japan, Apr. 18, 1975, 50-46321
Int. Cl.² H01L *29/78, 27/10*
U.S. Cl. 357—24 22 Claims



1. A semiconductor memory device, which comprises:
a semiconductor material substrate having one particular conductivity type and comprising, on the surface thereof, a doped layer with an impurity of the opposite conductivity type, a first surface region of said substrate adjoining said doped layer used as a gate region, a second surface region of said substrate adjoining said first surface region used as a memory cell region, and further comprising in the interior thereof a buried layer of said opposite conductivity type situated below said memory cell region of said substrate;
a doped layer electrode disposed on said substrate and electrically connected with said doped layer;
a first insulating layer placed on said substrate and, with said doped layer electrode, incompletely covering said doped layer so as to form an aperture exposing a part of said doped layer;
a gate electrode placed over said gate region and electrically insulated from said gate region by at least said first insulating layer; and
a memory cell electrode placed over said memory cell region and electrically insulated from said memory cell region by at least said first insulating layer; wherein an electric charge of said opposite conductivity type is either injected from said doped layer through said gate region into said buried layer to be stored in this layer or withdrawn from said buried layer through said gate region to said doped layer, depending upon the electric potential levels in said substrate, which levels are established by electric fields created by each of said electrodes through said insulating layers.

4,062,038

RADIATION RESPONSIVE DEVICE

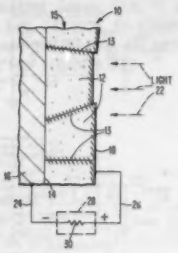
Jerome John Cuomo, Bronx; Thomas Herman DiStefano, Tarrytown, and Robert Rosenberg, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

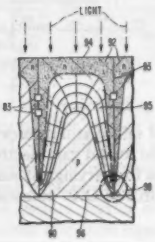
Filed Jan. 28, 1976, Ser. No. 652,961
Int. Cl.² H01L *27/14*
U.S. Cl. 357—30 9 Claims

1. Radiation responsive device comprising:
a semiconductor body having a carrier collection surface adapted to receive said radiation, metallic contacts connected to said body for substantially collecting electrons and holes generated by incident radiation in the active volume of said semiconductor body as external current,
said semiconductor body comprising
a crystalline semiconductor region of a given conductivity type having defects therein selected from the class consisting of linear and planar defects which are topologically connected to said radiation receptive surface including

therewith recombination centers thereat for charge carriers,

zones of relatively high dopant concentrations of opposite conductivity type proximate respectively to said defects and which substantially envelop them for establishing an





electric field pattern in said active volume of said semiconductor body which repels one of said electrons or holes, and collects the other of said electrons or holes, and

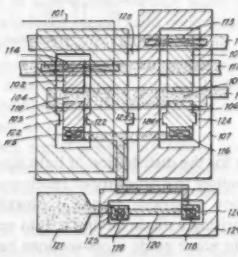
semiconductor junction means in association with said semiconductor region which together with said zones of dopant concentrations establishes said electric field pattern.

4,062,039

SEMI-CONDUCTOR INTEGRATED CIRCUIT

Izuhiko Nishimura, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Feb. 3, 1976, Ser. No. 654,688
Claims priority, application Japan, Feb. 3, 1975, 50-14112
Int. Cl.[2] H01L *27/02, 29/34, 29/78*
U.S. Cl. 357—51 **9 Claims**



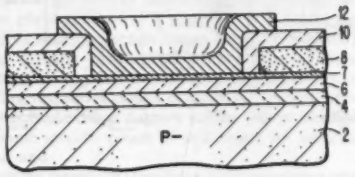
1. A semi-conductor integrated circuit comprising in combination, a C-MOS circuit formed of at least a P-channel field-effect transistor and an N-channel field-effect transistor, said circuit having respective input and output terminals, said field-effect transistors having commonly coupled drain output terminals, resistance means for reducing the secondary breakdown of said field-effect transistors, said resistance means being coupled intermediate said commonly coupled drain output terminals and said circuit output terminal, power terminals, and a stopper region associated with said drain output terminal, said stopper regions being referenced to one of said power terminals, the distance between at least one of said drain output terminals and said associated stopper regions defining a junction region adapted to be subject to primary breakdown at a voltage lower than a predetermined voltage, said predetermined voltage being lower than the primary breakdown voltage of the remaining junction of said C-MOS circuit.

4,062,040

FIELD EFFECT TRANSISTOR STRUCTURE AND METHOD FOR MAKING SAME

Shakir Ahmed Abbas, Wappingers Falls, and Robert Charles Dockerty, Highland, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Division of Ser. No. 635,523, Nov. 26, 1975. This application Mar. 24, 1977, Ser. No. 780,943
Int. Cl.[2] H01L *29/34*
U.S. Cl. 357—54 **2 Claims**



1. In a field effect transistor which includes a composite silicon dioxide-silicon nitride insulating layer over the active regions thereof;

a field shield electrode of polycrystalline silicon over a portion of said composite layer;

a conductive silicon dioxide layer over the upper and sidewall surfaces of said field shield; and

a gate electrode disposed over said composite layer and insulated from said field shield by said conductive silicon dioxide layer;

the improvement comprising;

a layer of highly resistive material disposed between said conductive silicon dioxide layer and said silicon nitride layer;

said material selected from group consisting of silicon oxynitride and silicon dioxide.

4,062,041

INPUT VOLTAGE CONTROLLED OSCILLATOR CIRCUIT FOR A TELEVISION SIGNAL TIME BASE CORRECTOR

Michael W. Tallent, San Jose; Lee E. Scaggs, Mountain View; Allan L. Swain, Palo Alto; Ronnie M. Harrison, and William B. Hendershot, III, both of San Jose, all of Calif., assignors to Consolidated Video Systems, Inc., Santa Clara, Calif.

Division of Ser. No. 381,463, July 27, 1973, Pat. No. 3,860,952. This application Jan. 10, 1975, Ser. No. 540,025
Int. Cl.[2] H04N *5/76, 9/46*
U.S. Cl. 358—8 **3 Claims**

1. An oscillator circuit for generating reference signals having a frequency corrected in accordance with time base errors in video type signals, said circuit comprising:

an oscillator having a control signal input for generating a reference signal train having a frequency dependent upon a control signal present at said control signal input;

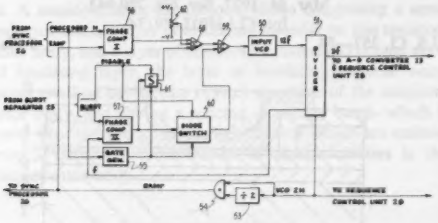
means coupled to said oscillator for generating a sync reference signal;

a first phase comparator means having a first input coupled to said sync reference signal and a second input adapted to be coupled to the sync portion of said video type signals,

said first phase comparator means including means for detecting a first phase difference between said sync reference signal and successive ones of said sync portions of said video type signals, and means for generating a first control signal having a magnitude dependent upon said first phase difference;

means coupled to said oscillator for generating a color burst frequency reference signal;

a second phase comparator means having a first input coupled to said color burst frequency reference signal and a second input adapted to be coupled to the color burst portions of said video type signal, said second phase comparator means including means for detecting a second phase difference between said color burst frequency reference signal and successive ones of said color burst portions of said video type signals and means for generating a second control signal having a magnitude dependent upon said second phase difference;



means for coupling said first and second control signals to said control signal input of said oscillator, whereby said reference signal train frequency varies in accordance with the magnitude of said first and second control signals to minimize said first and second phase differences;

said coupling means including gating means for transmitting said second control signal to said control signal input, and means for enabling said gating means during the color burst portion of successive lines of said video type signals;

gated integrator means coupled to said second phase comparator means for integrating successive ones of said second control signals over a plurality of successive lines of said video type signals; and

means for enabling said gated integrator means during the color burst portion of successive lines of said video type signals.

4,062,042

D.C. CONTROLLED ATTENUATOR

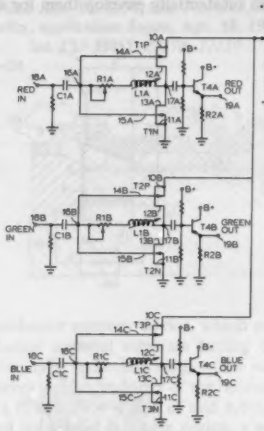
Arthur Richard Ott, Kitchener, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Oct. 7, 1976, Ser. No. 730,620

Int. Cl.[2] H04N 9/537; H03F 3/18; H03G 3/10

U.S. Cl. 358—27 **9 Claims**

1. A D.C. controlled attenuator comprising an integrated circuit including at least four MOS field effect transistors on a common substrate, said transistors including at least first and second n-channel and at least first and second p-channels transistors each having drain, source and gate electrodes, said first n-channel and p-channel transistors being connected in complementary symmetry with said gate electrodes thereof being connected together, said drain electrodes thereof being connected together and a source of D.C. potential connected between said source electrodes thereof, said n-channel and p-channel transistors being connected in complementary symmetry with said gate electrodes thereof being connected together, said drain electrodes thereof being connected together, and said source of D.C. potential being connected between said source electrodes thereof, a first variable resistor connected between said gate electrodes of said first transistors and said drain electrodes of said first transistors providing a first feed signal path, a second variable resistor connected between said gate electrodes of said second transistors and said drain electrodes of said second transistors providing a second feed forward signal path, means for supplying a first input signal to said



gate electrodes of said first transistors, means for supplying a second input signal to said gate electrodes of said second transistors, and means for varying the magnitude of the D.C. potential of said source of D.C. potential.

4,062,043

APPARATUS FOR DISTRIBUTING LIGHT SIGNALS AMONG A PLURALITY OF RECEIVERS

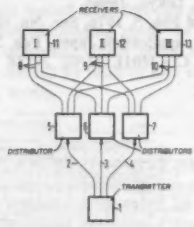
Güenter Zeidler, Unterpfaffenhofen, and Franz Auracher, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 25, 1975, Ser. No. 561,843

Claims priority, application Germany, Mar. 28, 1974, 2415046

Int. Cl.[2] H04N 7/18; H04B 9/00

U.S. Cl. 358—86 **2 Claims**



2. Apparatus for the distribution of light signals from at least one laser transmitter to a plurality of receivers for the distribution of television programs among a plurality of television receivers comprising a diode having a light emitting surface, a plurality of light wave guide cross-sections having a total area no greater than the area of said light emitting surface, a plurality of optical receivers, and a plurality of light wave guides corresponding in number to the number of said light wave guide cross-sections for operatively interconnecting said laser transmitter and said optical receivers, the ends of said light wave guides which are operatively connected to said diode being disposed in close side-by-side relation to one another and in close proximity to the light emitting surface of said diode.

4,062,044

COLOR TELEVISION RECEIVER EMPLOYING ELASTIC SURFACE WAVE FILTER

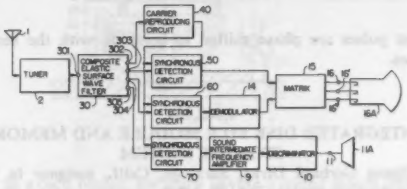
Kentaro Hanma, Yokohama, and Gentaro Miyazaki, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 6, 1976, Ser. No. 655,854

Claims priority, application Japan, Feb. 7, 1975, 50-15353; Feb. 14, 1975, 50-17893; Feb. 14, 1975, 50-17895; Feb. 19, 1975, 50-19737; Feb. 19, 1975, 50-19738; Feb. 19, 1975, 50-19739

Int. Cl.² H04N 9/535

U.S. Cl. 358—21 16 Claims



1. A color television receiver employing an elastic surface wave filter comprising:

a color television signal source producing a color television signal modulated by a color picture signal including a luminance signal and color-difference signals, said signal source including intermediate frequency signal generating means for generating a picture intermediate frequency signal including the picture carrier in response to the application of said color television signal thereto;

a substrate of material permitting propagation of an elastic surface wave;

first transducer means disposed on said substrate and connected to said color television signal source for converting said color television signal into an elastic surface wave;

second transducer means disposed on said substrate for converting said elastic surface wave into a first electrical signal including the luminance signal of picture intermediate frequency but not including the color-difference signals of picture intermediate frequency in response to the application of said elastic surface wave appearing from said first transducer means and propagating toward it on said substrate;

third transducer means disposed on said substrate for converting said elastic surface wave into a second electrical signal including the color-difference signals of picture intermediate frequency but not including the luminance signal of picture intermediate frequency in response to the application of said elastic surface wave appearing from said first transducer means annd propagating toward it on said substrate;

luminance signal generating means connected to said second transducer means for generating the luminance signal by detecting the electrical signal output of said second transducer means; and

color-difference signal generating means connected to said third transducer means for generating the color-difference signals by detecting the electrical signal output of said third transducer means;

wherein fourth transducer means is disposed on said substrate for converting said elastic surface wave applied from said first transducer means thereto into a third electrical signal including solely the picture carrier of picture intermediate frequency and not including the luminance signal and color-difference signals of picture intermediate frequency, and wherein said color-difference signal generating means generates the color-difference signals by detecting said second electrical signal utilizing said third electrical signal.

4,062,045

THREE-DIMENSIONAL TELEVISION SYSTEM

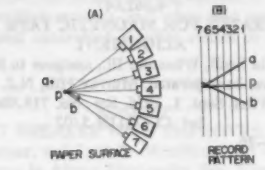
Waro Iwane, Sapporo, Japan, assignor to The President of Hokkaido University, Hokkaido, Japan

Filed Feb. 24, 1976, Ser. No. 660,647

Claims priority, application Japan, June 2, 1975, 50-65431

Int. Cl.² H04N 9/54

U.S. Cl. 358—88 16 Claims



7. A three-dimensional television system comprising a multiple image photographing and transmitting apparatus including:

a multiple image camera means for photographing an object to be photographed at a plurality of different planes to obtain a multiple picture image for each different plane;

angular division distribution pattern forming means for forming an angular division distribution pattern by connecting respective points of each said image obtained by said multiple image camera means which correspond to the same specific points of said object for each different plane; and

transmitting means for classifying for transmission said angular division distribution pattern into at least brightness signals and depth signals.

11. A three-dimensional television system comprising a monocular photographing and transmitting apparatus including:

a monocular camera for photographing an object to be photographed at a plurality of different planes to obtain a picture image for each different plane;

angular division distribution pattern forming means for forming an angular division distribution pattern by connecting respective points of each said image obtained by said monocular camera which correspond to the same specific points of said object for each different plane; and

transmitting means for classifying for transmission said angular division distribution pattern into at least brightness signals and depth signals.

4,062,046

LASER MACHINING

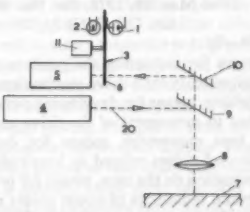
Norman Leslie Pratt, 67 Sunningdale Drive, Daventry, Northants, and Michael Bowen Davies, 2 Palmers Close, Hillmorton, Rugby, both of England

Filed Nov. 5, 1976, Ser. No. 739,279

Claims priority, application United Kingdom, Nov. 21, 1975, 48060/75

Int. Cl.² H04N 7/18

U.S. Cl. 358—93 5 Claims



1. A closed circuit television system for viewing the pulsed

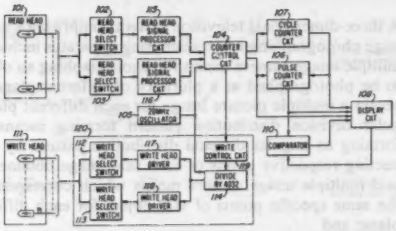
laser beam machining of a workpiece said system including a TV camera tube which, in use, is pointed at the area of incidence of the laser beam on said workpiece, a rotary shutter in the optical path of said TV camera tube for intercepting intermittenly the light passing along said optical path, and means for synchronising the pulsing of the laser and the rotation of said shutter so that, in use, said shutter prevents light from reaching said TV camera tube each time said laser is pulsed.

4,062,047

APPARATUS FOR MAGNETIC TAPE HEAD ALIGNMENT

Harvey Ronald Scull, Wheaton, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 1, 1976, Ser. No. 719,586
Int. Cl.[2] G11B *5/02*
U.S. Cl. 360—26 **20 Claims**



1. Apparatus for measuring tape head skew in a multiple track magnetic tape recording system by measuring the elapsed time between the occurrence of corresponding peaks of substantially identical alternating output signals read from two tracks of a magnetic recording tape, comprising:

first and second signal processor means for generating signals indicative of the level and signals indicative of the peaks of the output signals read from the two tracks;

first and second means for selectively connecting said output signals read from any one of a plurality of tracks to said first and second signal processor means respectively;

oscillator means for generating a signal comprising repetitive pulses having a repetition period which is short relative to an allowable skew period;

counter means;

means for gating said repetitive pulses to said counter means;

means responsive to said signals from said first and second signal processor means for enabling said gating means during the time between the occurrence of corresponding peaks of said output signals; and

means for displaying the contents of said counter means.

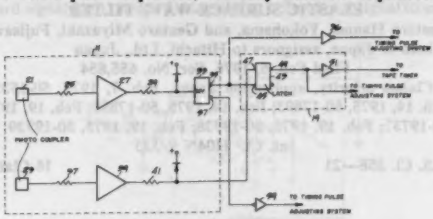
4,062,048

TAPE TIMING APPARATUS AND METHOD EMPLOYING A PHASE COMPARISON BETWEEN SEQUENTIAL PULSE TRAINS

Donald William Weber, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 19, 1976, Ser. No. 668,659
Int. Cl.[2] G11B *15/00*
U.S. Cl. 360—72 **9 Claims**

1. Apparatus for indicating the position of recording tape, moved longitudinally by a drive mechanism, relative to a tape head, comprising, means for developing periodic electrical first pulses related to movement of the drive mechanism which is related to tape movement, means for developing periodic electrical second pulses related to longitudinal spacing of recorded information on the tape, means for producing a series of equal numbered sequences of count pulses related to said first pulses, means for beginning a new one of said sequences of said count pulses only upon the occurrence of a detected phase difference between said second pulses and said first pulses, and means for producing an indication of tape position related to the count pulse sequences, whereby the new sequences of



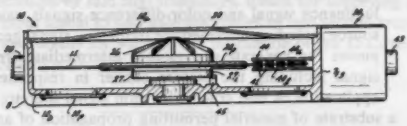
count pulses are phase shifted to coincide with the second pulses.

4,062,049

INTEGRATED DISK FILE MODULE AND MEMORY STORAGE SYSTEM

Wolfgang Gerhard Dirks, Saratoga, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 2, 1976, Ser. No. 673,115
Int. Cl.[2] G11B *5/82*
U.S. Cl. 360—78 **1 Claim**



1. A completely integrated and self contained disk file module enclosed within its own sealed container comprising:

a. a horizontal baseplate having a plurality of vertical flanges;

b. a support frame housing a vertical spindle, said support frame mounted centrally on said horizontal baseplate;

c. a motor comprising a stator mounted on said support frame and a rotor unit mounted on said spindle for rotation around said stator, said rotor unit supporting a magnetic disk;

d. a magnetic disk having a central opening, said motor being integral with said disk by means of said opening;

e. an actuator assembly mounted on one of said vertical flanges, said actuator assembly including:

e-1. a voice-coil supporting upper and lower head-support arms;

e-2. said upper and lower head support arms supporting a plurality of upper and lower transducer heads adjacent both planar surfaces of said magnetic disk;

e-3. means to control the position of said transducer means in relation to the plane surfaces of said magnetic disk, said means including:

e-3-a. a rotary solenoid mounted adjacent one end of said voice-coil;

e-3-b. a rotatable cam mounted at the opposite end of said voice-coil;

e-3-c. a central rotatable rod connecting said rotary solenoid and said rotatable cam;

e-3-d. upper and lower pivot pins, located opposite from said solenoid-end of said voice-coil, said pivot pins rotatably supporting said upper and lower head-support arms, whereby activation of said rotary solenoid will rotate said cam to cause clockwise rotation of said upper head-support arm and to cause counter-clockwise rotation of said lower head-support arm to respectively move said upper and lower transducing heads out of and into transducing position with respect to the surfaces of said magnetic disk.

4,062,050

MAGNETIC CARD READER

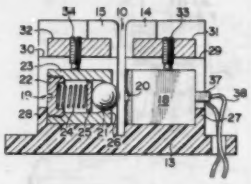
Youjiro Shigemori; Yoshio Mitumori, and Toshiaki Yonezawa, all of Shizuoka, Japan, assignors to Star Seimitsu Kabushiki Kaisha, Japan

Filed Mar. 19, 1976, Ser. No. 668,406

Claims priority, application Japan, Mar. 20, 1975, 50-36538[U]

Int. Cl.² G11B 15/60, 15/12, 19/02

U.S. Cl. 360—130 10 Claims



1. In a card reader, for cards having a coded region formed of a magnetic medium, comprising a body defining a guide slot of a width which permits a card to be passed therethrough, and a transducer located adjacent to the guide slot for reading information recorded on a card as the card passes through the guide slot: the improvement which comprises backup means disposed on the opposite side of the guide slot as said transducer and in an opposing relationship with the transducer for maintaining a card passing through the slot adjacent said transducer as the card passes said transducer, said backup means including a ball head having a generally spherical surface which is normally biased into its operative position directly across the slot from said transducer at which it extends into the guide slot to define a gap between said generally spherical surface and said transducer of a length which is less than the thickness of the card, said backup means further including spring means for biasing the ball head into its operative position, and support means for normally maintaining the ball head in its operative position and for permitting the ball head to move away from the transducer against the resilience of the spring means while urging the card against the transducer as the card is moved through the guide slot.

4,062,051

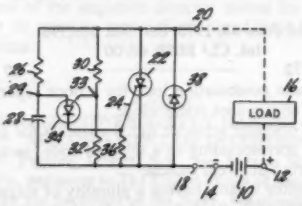
BATTERY SPARK SUPPRESSION CIRCUIT

Frederick L. Way, 3540 Swenson St., Apt. No. 124, Las Vegas, Nev. 89109

Filed Apr. 7, 1976, Ser. No. 674,829

Int. Cl.² H02H 7/22

U.S. Cl. 361—6 5 Claims



1. A circuit for suppressing arcing upon connection or disconnection of a load to a direct current source, comprising:

a silicon controlled rectifier, having first and second terminals and a control input, for permitting current to flow in a forward direction between said terminals in response to a signal applied to said control input, said rectifier being connected to cease conducting on interruption of said forward current;

and automatic electronic control means connected across said terminals, and responsive to forward voltage applied across said terminals for applying a triggering signal to said control input a selected time after said voltage is applied;

whereby when said first terminal is connected to a first pole of the current source, and the load is connected between said second terminal and a second pole of the current source, a voltage is applied across said terminals causing said control means to apply a triggering signal to said control input, thereby permitting current to flow through said controlled rectifier, and when said current is interrupted, said controlled rectifier ceases to conduct said current.

4,062,052

CIRCUIT BREAKER WITH IMPROVED DELAY

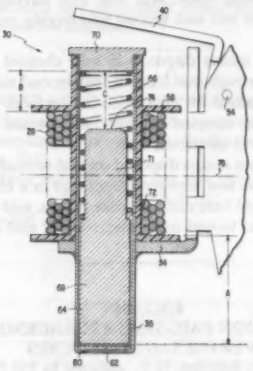
George S. Harper, and Lyal N. Merriken, both of Cambridge, Md., assignors to Airpax Electronics, Inc., Cambridge, Md.

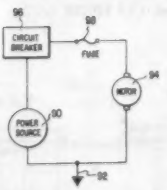
Continuation-in-part of Ser. No. 532,645, Dec. 13, 1974, Pat. No. 3,959,755. This application May 7, 1976, Ser. No. 684,232

The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.² H02H 7/08; H01H 7/00

U.S. Cl. 361—28 17 Claims





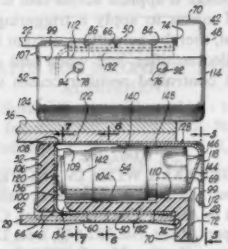
1. A circuit breaker comprising a pair of electrical contacts, a handle, a collapsible toggle coupling said handle to one of said contacts, a movable armature having a portion adapted to engage and trip said toggle, a frame, a hollow delay tube carried by said frame and having a magnetic pole piece at one end, a magnetic core movable in said delay tube, a trip coil surrounding a portion of said trip tube, said coil being spaced from the plane of the near end of said pole piece by a non-conductive, non-magnetic gap having a length of from about one-fifteenth to about one-sixth the overall interior length of said delay tube, and spring means in said delay tube normally biasing said core into a position away from said pole piece, said core when in said position extending from the end of said delay tube remote from said pole piece to a point short of a plane containing the electrical center of said trip coil.

4,062,053

PROTECTOR MODULE

Casimir Cwirzen, Wheeling, Ill., assignor to Cook Electric Company, Morton Grove, Ill.

Filed Dec. 22, 1975, Ser. No. 642,914
Int. Cl.[2] H02H 7/20
U.S. Cl. 361—119 15 Claims



1. A protector module for use in a protection system, said protector module comprising:

an elongated insulating base having first and second elongated, opposing sides, said first side having a channel means therein and said second side having receiving surfaces,

a line contact means disposed in said channel means and extending through said base to said second side,

an arrester disposed on said receiving surfaces and having one electrode coupled to said line contact means and having another electrode, and

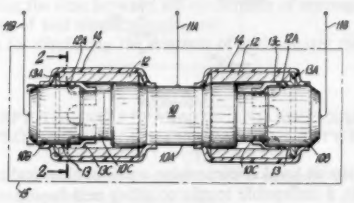
a conductive case means disposed on said second side of said base such that said arrester is enclosed in a closed cavity formed by said base and said case means, said case means being coupled to said other electrode of said arrester.

4,062,054

MULTI-FUNCTION FAIL-SAFE ARRANGEMENTS FOR OVERVOLTAGE GAS TUBES

Frank L. Simokat, Babylon, N.Y., assignor to TII Corporation, Lindenhurst, N.Y.

Filed Aug. 31, 1976, Ser. No. 719,076
Int. Cl.[2] H02H 3/22
U.S. Cl. 361—119 9 Claims



1. A unitary circuit breaker module having backup and fail-safe features comprising:

1. a gas tube surge arrestor containing a sealed gas filled ionizable gap defined by first and second sections of said tube, said sections being insulated from each other and at least one of said sections including an electrode;

2. backup air gap means connected in parallel with said ionizable gap and in thermally responsive relation thereto, said air gap means being dimensioned to provide backup protection for said ionizable gap;

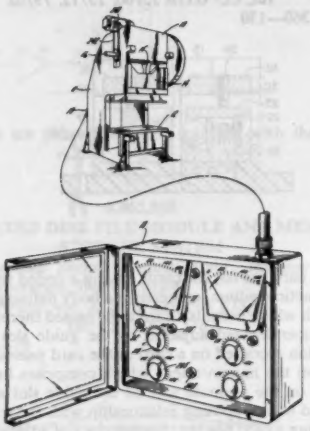
3. said air gap means also including fusible means for shorting said ionizable gap in the event of a sustained surge.

4,062,055

LOAD MONITORING SYSTEM WITH HIGH AND LOW LOAD CONTROL

William P. Dybel, and Frank R. Dybel, both of 981 Wingate Road, Olympia Fields, Ill. 60461

Filed Oct. 17, 1975, Ser. No. 623,484
Int. Cl.[2] H01H 47/32
U.S. Cl. 361—160 30 Claims



1. A system for monitoring loads that are cyclically applied to a force carrying member comprising mounting means fixed to said member substantially in line with the stress to be detected, a transducer interposed between said mounting means and having a pair of output terminals with a piezoelectric crystal therebetween for providing at said output terminals an electrical signal substantially proportional to the stress applied to said member, load detector means for providing an output indication upon activation, detector control means coupled to said transducer terminals, means for selectively establishing a reference voltage at said control means, said control means being actuated during a loading cycle when the transducer signal to said control means exceeds said reference voltage by a pedetermined amount, and means responsive to the failure of said control means to be actuated during a loading cycle for activating said load detector means.

4,062,056

MULTIPLE CODE ELECTRONIC COMBINATION DOOR LOCK

David E. Goodrich, 3327 Winthrop Ave., Suite 157, Fort Worth, Tex. 76116

Filed June 23, 1975, Ser. No. 589,796
Int. Cl.[2] E05B 49/00
U.S. Cl. 361—172 17 Claims

1. An electronic combination lock for a door separating a non-secure and secure area comprising:

a plurality of operator actuable signal switches for generating signals corresponding to a selected code, each signal switch bearing different indicia;

sequence detector means, having a plurality of stages equal to the number of digits in the code, for providing a signal only if each stage receives a signal in proper sequential order;

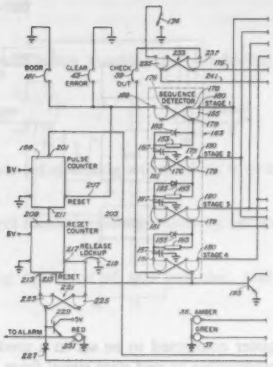
a first selector means for selecting a first code and transmitting a signal from each of the signal switches selected to be within the first code to the sequence detector means;

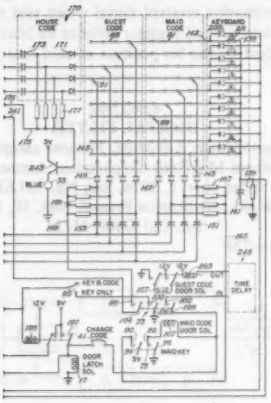
a second selector means for selecting a second code and transmitting a signal from each of the signal switches selected to be within the second code to the sequence detector means;

a third code circuit means for transmitting a signal from each

of the signal switches set within the third code to the sequence detector;

means for selectively activating either the first selector means, the second selector means, or the third code circuit means to be responsive to the generation of signals by the signal switches selected within each respective code; and





an electrically actuated control means connected to the output of the sequence detector means for allowing the door to open in response to signal from the sequence detector.

4,062,057

REGULATED POWER SUPPLY HAVING A SERIES ARRANGEMENT OF INVERTERS

Donald W. Perkins, Dewitt, N.Y., and Marvin W. Smith, Roanoke, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 15, 1977, Ser. No. 788,103
Int. Cl.² H02M 3/335
U.S. Cl. 363—71 **4 Claims**

1. In an A.C.-to-D.C. regulated power supply of the type utilizing inverters in its operation, the combination of

the source of A.C. voltage;

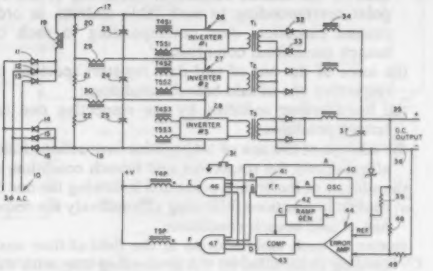
means for rectifying said A.C. voltage so as to develop a D.C. voltage of a predetermined magnitude across a pair of lines;

a pair of inverters having their inputs connected in series across said lines;

a pair of equal resistors connected in series across said lines;

a pair of equal capacitors connected in series across said lines;

means for connecting the junction between said capacitors to the junction between said inverters such that the input impedance of an inverter is effectively across a capacitor;



a current operated circuit disconnect means connected between the junctions of said resistors and said capacitors; and

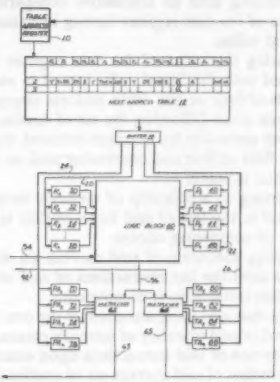
means responsive to a current flow of a predetermined magnitude through said disconnect means for rendering said pair of inverters inoperative.

4,062,058

NEXT ADDRESS SUBPROCESSOR

Leonard S. Haynes, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 13, 1976, Ser. No. 657,812
Int. Cl.² G06F 9/20
U.S. Cl. 364—200 **7 Claims**



1. A method for determining the next program address of a routine controlling that portion of a digital computer dedicated to processing programs, the routine having a plurality of sets of addressed instructions, the last instruction in each set being separated from any other set by at least one branch point, each branch point having a plurality of lateral branch conditions followed by a default condition, each branch condition specifying the name of a selected one of the data registers and a literal value to be compared against the value of the specified one of the data registers, and followed affirmatively by one of the sets of instructions, and the computer having a plurality of named data registers for receiving the instructions of a program and a program counter for retaining the address of the current routine instruction, comprising the steps of:

identifying each of a plurality of multi-field table locations in an addressable table memory with a table address corre-

sponding to a different one of said branch points, the number of fields represented by each table address to exceed by at least four a quantity equal to four times the number of branch conditions at the corresponding branch point;

storing at each table address in successive fields of four, for each of the branch conditions occurring at the branch point corresponding to each table address, in order of routine execution, data corresponding to each of the branch conditions, comprising:

the name of the one of said data registers specified by the respective one of said branch conditions;

the literal value specified by the respective one of said branch conditions;

the address of the one of said routine instructions following affirmatively the respective said branch condition; and,

the address of the branch point first following the one of said routine instructions following affirmatively the respective one of said branch conditions;

storing at each table address in the field-of-four next succeeding those filled by the preceeding step with data for the corresponding branch point, comprising:

a default que word;

a logically blank word;

the address of the one of said routine instructions following the default condition of the corresponding branch point; and,

the address of the branch point first following the one of said routine instructions following the default condition of the corresponding branch point;

initiating execution of a current set of said routine instructions;

loading a program into said data registers according to the order of said routine;

comparing at the table address corresponding to the branch point following the set of routine instructions for which execution has been last initiated, in each of successive fields-of-four, beginning with the first field-of-four and continuing until an affirmative comparison is made, the value of the data register having its name stored with the literal value;

comparing the value of the data register having its name stored with the literal value stored in each of successive fields-of-four at the table address corresponding to the branch point following the set of routine instructions for which execution has been last initiated, beginning with the first field of four and continuing until an affirmative comparison is made;

transferring to a plurality of memory means the addresses stored in the last of said fields-of-four in which said said step of comparing occurs;

continuing execution of said current set of routine instructions until the last instructions of said current set of said routine instuctions is completed;

loading into said program counter the one of said addresses stored in said plurality of memory means and corresponding to one of said instructions upon execution of said last instruction of said current set of routine instructions; and,

initiating execution of the set of routine instructions beginning with that one of said instructions corresponded by the address currently in said program counter.

4,062,059

INFORMATION PROCESSING SYSTEM

Seigo Suzuki, Yokohama, and Yoshiaki Moriya, Inagi, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

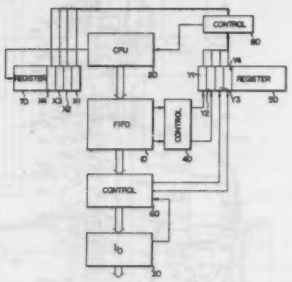
Filed Oct. 15, 1976, Ser. No. 732,872

Claims priority, application Japan, Oct. 15, 1975, 50-123238

Int. Cl.² G06F *13/00*

U.S. Cl. 364—200 **2 Claims**

1. An information processing system comprising first and second information processing units, a first-in first-out stack acting as a buffer and connected between said first and second information processing units, a first register connected to be set to a predetermined bit position in accordance with a programmed information from said first information processing unit for producing an interruption condition signal corresponding to said bit position, a first control circuit connected to detect the state of said first-in first-out stack for producing a state signal corresponding to the state of first-in first-out stack,



a second register connected to be set to a predetermined bit position corresponding to said state signal from said first control circuit for generating a state indicating signal, and an interruption control circuit coupled to said first and second registers and to said first information processing unit for generating an interruption control signal when said state indicating signal from said second register satisfies an interruption condition established by the bit position of said first register.

4,062,060

DIGITAL FILTER

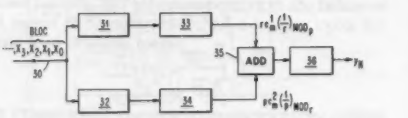
Henri J. Nussbaumer, LaGaude, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,631

Claims priority, application France, Nov. 10, 1975, 75.35235

Int. Cl.² G06F *15/34*

U.S. Cl. 364—724 **7 Claims**



1. A digital filter for a series of samples of a signal, said filter characterized in that it includes:

an input to which the samples of the signal to be filtered are applied;

an input control means for separating said samples into data blocks of a fixed length;

at least two different circular convolution generators, each having an input receiving each of said data blocks and generating the terms resulting from the circular convolution of the samples of each said block with an associated block of coefficients defining the required filtering operation of the generator;

a product means for each circular convolution generator for multiplying the output of the associated one of said generators by a correcting term specific to the attached generator;

an adder for adding together the corresponding terms in the outputs of said two product means; and

a means for combining selected ones of the terms supplied by said adder to produce a series of samples representing the filtered signal.

4,062,061

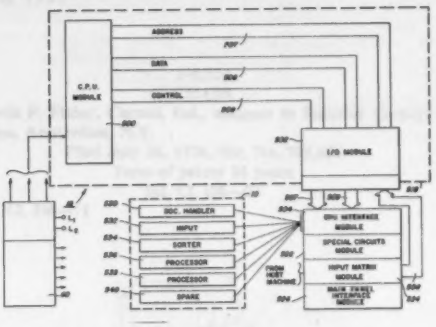
ERROR LOG FOR ELECTROSTATOGRAPHIC MACHINES

Phillip J. Batchelor, Fairport; Robert L. Traister, Rochester; Gary A. Gray, and Joseph A. Marino, both of Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 15, 1976, Ser. No. 677,111
Int. Cl.[2] G06F *11/00*; G03G *15/00*
U.S. Cl. 364—900 1 Claims

1. In a reproduction machine for producing copies, the combination of:

control means for operating said machine to produce copies, said control means including a memory section; means for monitoring operation of said machine, said monitoring means generating a fault signal on the occurrence of a predetermined machine fault; and

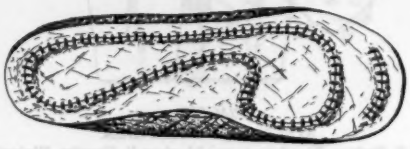


fault storing means for storing in said control means memory section each occurrence of said fault signal whereby to provide a record of the number of times said fault occurs.

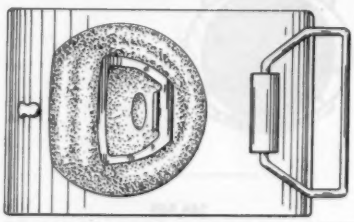
DESIGNS

DECEMBER 6, 1977

246,551
SHOE SOLE
Nikolaus Hansjosten, Pluwig, and Christoph Langwara, Mertesdorf, both of Germany, assignors to Industriewerke Lemm & Co. GmbH, Trier, Germany
Filed May 19, 1976, Ser. No. 687,662
Claims priority, application Germany, Nov. 25, 1975, 14625
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

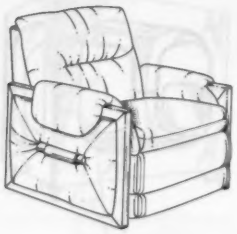


246,552
BELT BUCKLE OR SIMILAR ARTICLE
Daniel G. Baughman, P.O. Box 541, Darien, Wis. 53114
Filed Dec. 22, 1975, Ser. No. 642,746
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—406

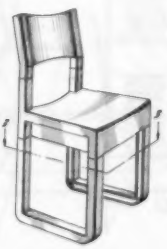


246,553
HIGH CHAIR
William Ballenger, 6030 Northwest Highway, Chicago, Ill. 60631
Filed Apr. 28, 1976, Ser. No. 680,883
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—8

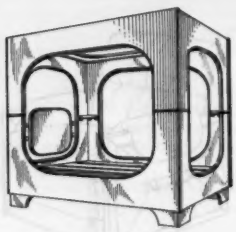
246,554
CHAIR
Morris F. Fisher, Carmel, Ind., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed July 26, 1976, Ser. No. 708,666
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



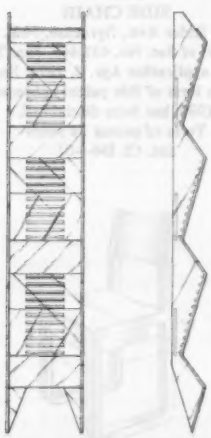
246,555
SIDE CHAIR
Harry Laylon, 259 Rider Ave., Syracuse, N.Y. 13207
Continuation-in-part of Ser. No. 431,448, Jan. 7, 1974, Pat. No. D. 237,332. This application Apr. 2, 1975, Ser. No. 564,250
The portion of the term of this patent subsequent to Oct. 28, 1989, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75



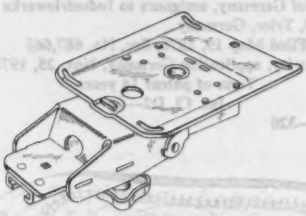
246,556
BED
Randolph C. Parsons, 645 West End Ave., New York, N.Y. 10025
Filed June 30, 1975, Ser. No. 591,620
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—79



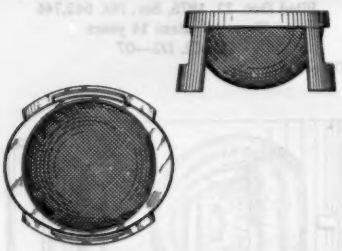
246,557
HOLDER FOR SEED PACKETS OR THE LIKE
Michael D. Gilmartin, 724 Thornhill Drive, Colma, Calif. 94015, and James A. Ginella, 564 N. San Antonio Road, Los Altos, Calif. 94022
Filed June 23, 1975, Ser. No. 589,493
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130



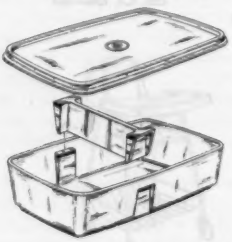
246,558
CHAIR CONTROL
Frank Doerner, 138 Aberdeen Road, Kitchener, Ontario, Canada
Filed Feb. 3, 1976, Ser. No. 654,799
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



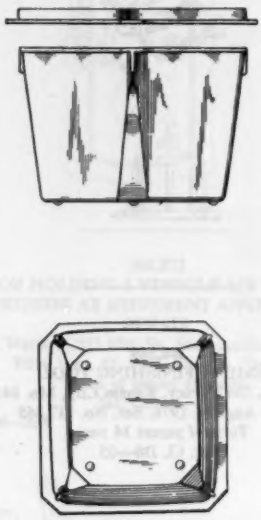
246,559
STACKABLE COLANDER
Fred S. Steiner, Woodmere, and Morison S. Cousins, Plainview, both of N.Y., assignors to Bonny Products, Inc., Hewlett, N.Y.
Filed Dec. 29, 1975, Ser. No. 644,568
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47



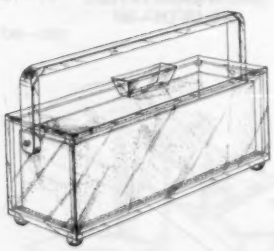
246,560
CLOSURED AND DIVIDED STORAGE BOX OR THE LIKE
Roger P. Beauchamp, 7 Stewart Court, Harrisville, R.I. 02830, and Robert F. Bateman, 35 Fanning Lane, Greenville, R.I. 02828
Filed Jan. 26, 1976, Ser. No. 652,456
Term of patent 14 years
Int. Cl. D7—*01, 07*
U.S. Cl. D7—76



246,561
COVERED STORAGE CONTAINER
Alvin J. Stahel, Brighton, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Feb. 6, 1976, Ser. No. 653,946
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—76

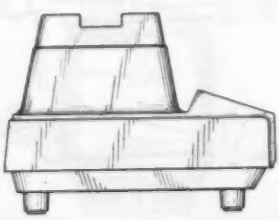


246,562
COMBINED ICE CHEST AND WINE COOLER
Ione M. Stoddard, 1501 S. Flagler Drive No. 8F, West Palm Beach, Fla. 33401
Filed Mar. 19, 1976, Ser. No. 668,779
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—78

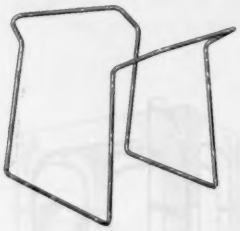


246,563
KNIFE OR A SIMILAR ARTICLE
Vivanna Torun Bulow Hube, Wolfsburg, Germany, assignor to Dansk International Designs Ltd., Mount Kisco, N.Y.
Division of Ser. No. 561,952, March 25, 1975, abandoned. This application Mar. 15, 1977, Ser. No. 777,974
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—150

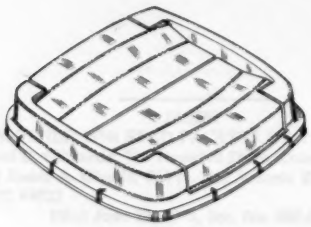
246,564
BLENDER BASE
David K. Haufe, Hinsdale, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Mar. 22, 1976, Ser. No. 669,463
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—154



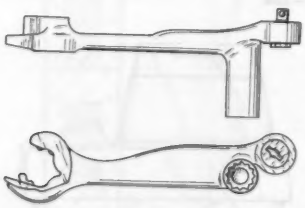
246,565
SUPPORT STAND FOR FLEXIBLE BAGS
Harry B. Roark, 2710 NE. Russell Road, Kansas City, Mo. 64117
Filed Aug. 18, 1976, Ser. No. 715,445
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—189



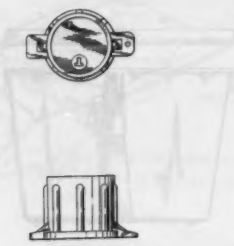
246,566
LID FOR REFUSE CONTAINER
Ralph Van Skiver, Arlington, Tex., assignor to Loma Corporation, Fort Worth, Tex.
Filed Apr. 29, 1976, Ser. No. 681,568
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—194



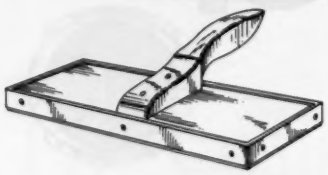
246,567
MULTI-PURPOSE TOOL
Melvin D. Bricker, 107 Miramar Road, No. B, Alameda, Calif. 94501
Filed May 24, 1976, Ser. No. 689,108
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—26



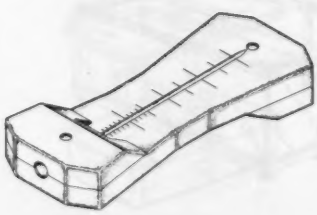
246,568
BLADE HOLDER TOOL FOR CUTTING A POUR SPOUT
Michael W. Brandt, 1111 W. Mockingbird Lane, Suite 1147, Dallas, Tex. 75247
Filed Mar. 8, 1976, Ser. No. 664,887
Term of patent 14 years
Int. Cl. D7—*99*; D8—*03*
U.S. Cl. D8—40



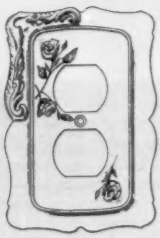
246,569
CEMENT FINISHING TOOL
Albert G. Wesson, 2547 Tracy, Kansas City, Mo. 64108
Filed Aug. 26, 1976, Ser. No. 717,565
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—45



246,570
HAND-HELD TOOL FOR REMOVING INSULATION FROM ELECTRICAL CONDUCTORS
Walter N. Christiansen, Spring Lake, Mich., assignor to Gardner-Denver Company, Dallas, Tex.
Filed Sept. 27, 1976, Ser. No. 726,855
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98

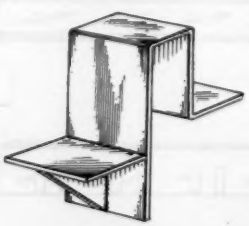


246,571
WALL PLATE
Joan Grieb, Westfield, N.J., assignor to General Electric Company
Filed Oct. 20, 1975, Ser. No. 624,089
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—350

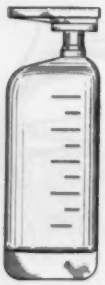


246,572
STAND FOR HOLDING A VEHICLE AIR CONDITIONER COMPRESSOR AT DIFFERENT ANGLES DURING REPAIR
Le Roy A. Walter, 2893 65th St., Sacramento, Calif. 95817
Filed Sept. 17, 1976, Ser. No. 724,715
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354

246,573
BASE BRACKET FOR SUPPORTING A BRICK VENEER WALL FROM A HOUSE FOUNDATION WALL
Donald E. White, 702 E. Pleasant View Drive, Des Moines, Iowa 50315
Filed Dec. 31, 1975, Ser. No. 645,807
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—384



246,574
BOTTLE OR SIMILAR ARTICLE
Eugene J. Meierhoefer, Hackettstown, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Continuation-in-part of Ser. No. 459,134, April 8, 1974, Pat. No. Des. 238,331. This application June 4, 1975, Ser. No. 583,808
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—67



246,575
WATCH CASE
Tsuyoshi Onodera, Urawa, and Satoshi Ishida, Tokyo, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha
Filed Dec. 31, 1975, Ser. No. 645,902
Claims priority, application Japan, Jan. 7, 1975, 50-27705
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30

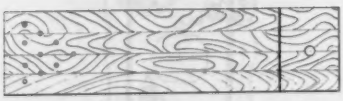
246,576
WATCH CASE
Kanji Inaba, Yokohama, Japan, assignor to Kabushiki Kaisha Daini Seikosha
Filed Jan. 2, 1976, Ser. No. 646,231
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30

246,577
WATCH CASE
Kanji Inaba, Yokohama, Japan, assignor to Kabushiki Kaisha Daini Seikosha
Filed Jan. 2, 1976, Ser. No. 646,355
Claims priority, application Japan, July 1, 1975, 50-27703
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30

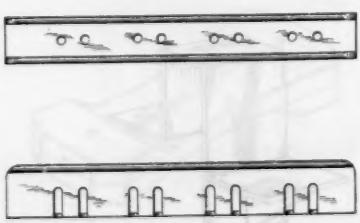
246,578
FIRE ALARM
Donald A. White, 4701 E. Kessler View, Indianapolis, Ind. 46220
Filed Feb. 9, 1976, Ser. No. 656,248
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

246,579
DIAMOND RING
Josef J. Barr, 293 S. County Road, Palm Beach, Fla. 33480
Filed Mar. 30, 1976, Ser. No. 672,026
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—34

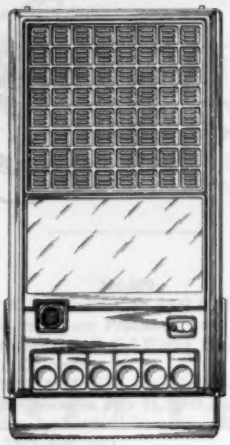
246,580
TROPHY BASE
Richard A. Rasmussen, 3430 Olive Ave., Long Beach, Calif. 90807
Filed Apr. 14, 1976, Ser. No. 677,005
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157

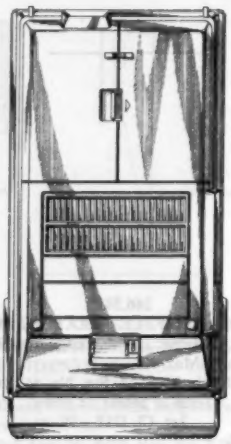


246,581
TELEPHONE CONNECTOR BLOCK GUIDE
Paul V. DeLuca, 6901 Jericho Turnpike, Syosset, N.Y. 11791
Filed Apr. 26, 1976, Ser. No. 680,239
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—13

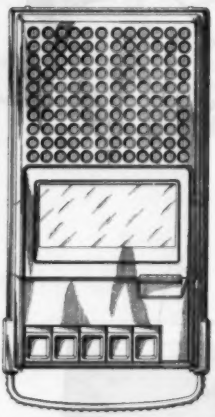


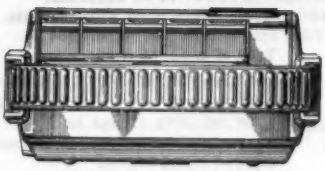
246,582
CASSETTE TAPE RECORDER
Tomoji Okada, Tokyo, Japan, assignor to General Electric Company
Filed Jan. 27, 1976, Ser. No. 652,768
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—6



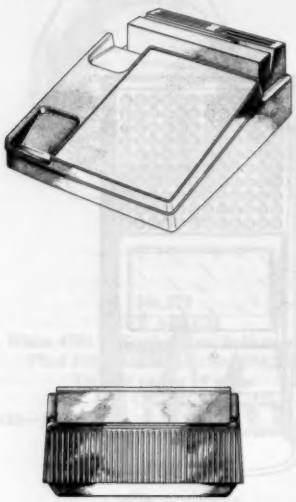


246,583
CASSETTE TAPE RECORDER
Tomoji Okada, Tokyo, Japan, assignor to General Electric Company
Filed Jan. 27, 1976, Ser. No. 652,769
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—6

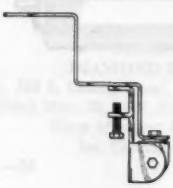


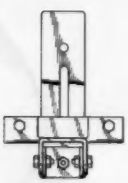


246,584
TELEPHONE STAND
Ghanshyam Ambaram Bhat, Matawan; Donald Michael Genaro, Haworth, both of N.J.; Gordon Elliot Sylvester, Jamaica, N.Y.; Edwin Watkinson, Colts Neck, and John William Wesner, Jr., Freehold Township, Moamouth County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Sept. 18, 1975, Ser. No. 614,510
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—57

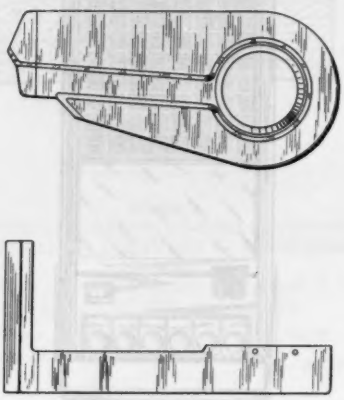


246,585
ANTENNA MOUNTING BRACKET
Alfred P. Parduhn, 14501 Wilson Road, Edmond, Okla. 73034
Filed June 1, 1976, Ser. No. 691,504
Term of patent 14 years
Int. Cl.[2] D14—*03, 99*
U.S. Cl. 14—91

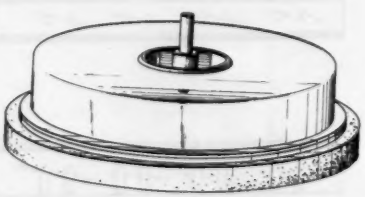




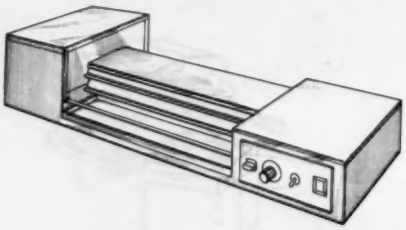
246,586
BELT GUARD FOR A ROTO-TILLER
Larry M. Cognata, 4725 Benton Smith Road, Nashville, Tenn. 37215
Filed July 26, 1976, Ser. No. 708,423
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12



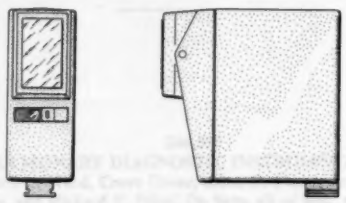
246,587
HEAD FOR A SURFACE-TREATING MACHINE
Samuel A. Miller, Livingston, N.J., assignor to Ruth Max Newman and Lester S. Max
Filed Feb. 27, 1976, Ser. No. 662,105
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—56



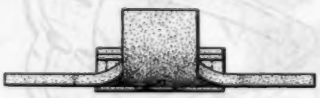
246,588
FILM DRYER
Michael J. Ferrarell, Chicago, Ill., assignor to Buckingham Graphics, Inc., Chicago, Ill.
Filed Feb. 2, 1976, Ser. No. 654,600
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—33



246,589
ELECTRONIC FLASH UNIT
Wilfried Höltje, and Claus Prochnow, both of Braunschweig, Germany, assignors to Rollei-Werke Franke & Heidecke, Braunschweig, Germany
Division of Ser. No. 433,532, Jan. 15, 1974, Pat. No. Des. 239,204. This application July 31, 1975, Ser. No. 600,625
Claims priority, application Germany, Aug. 13, 1973, MR 1010; Aug. 20, 1973, MR 1011
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42

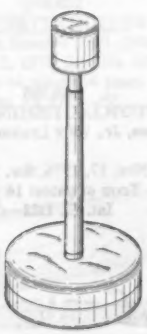


246,590
COMBINED LUGGAGE HANDLE LOOP AND CONCEALED IDENTIFICATION TAG OR SIMILAR ARTICLE
Pasquale R. Sollazzi, Newark, Del., assignor to M & M Luggage Co., Inc., Jersey City, N.J.
Filed Apr. 19, 1976, Ser. No. 678,056
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D19—13



246,591
COMBINED LUGGAGE FLAP AND CONCEALED IDENTIFICATION TAG OR SIMILAR ARTICLE
Pasquale R. Sollazzi, Newark, Del., assignor to M & M Luggage Co., Inc., Jersey City, N.J.
Filed Apr. 19, 1976, Ser. No. 678,191
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D19—13

246,592
DESK SET
Walter Zeischegg, Neu-Ulm, Germany, assignor to Hans Friedrich Hefendehl, Kierspe, Germany
Filed Apr. 13, 1976, Ser. No. 676,554
Claims priority, application Germany, Oct. 15, 1975, 459
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—75

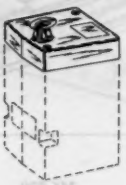


246,593
DESK TOP HANGER FOR SUSPENSION-TYPE DOCUMENT HOLDERS
Edmund T. Paquette, Shrewsbury, Mass., assignor to Wright Line Inc., Worcester, Mass.
Filed Apr. 5, 1976, Ser. No. 673,682
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—90

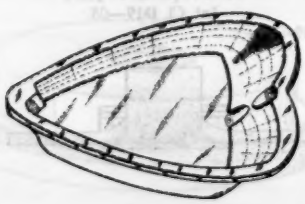
246,594
INSECT TRAP
Richard E. Rice, Dinuba, Calif., assignor to The Regents of the University of California, Berkeley, Calif.
Filed Dec. 2, 1975, Ser. No. 637,075
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—19

246,595
ARTIFICIAL FISHING LURE
William O. Williams, Jr., 1309 Lynhurst Drive, Gastonia, N.C. 28052
Filed Nov. 17, 1976, Ser. No. 743,296
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

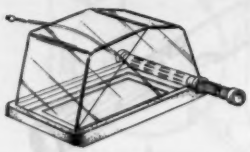
246,596
COVER FOR SOLENOID OPERATED PILOT VALVE
Daniel H. Fialkowski, and Russell J. Cameron, both of Rochester, Mich., assignors to Ross Operating Valve Company, Detroit, Mich.
Division of Ser. No. 597,832, July 21, 1975. This application Feb. 14, 1977, Ser. No. 768,077
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

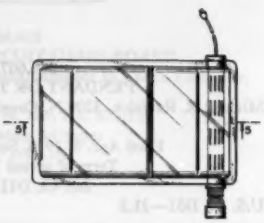


246,597
BATHTUB
Louis H. Ridgeway, R.F.D. 1, Jonesville, S.C. 29353
Filed June 17, 1976, Ser. No. 697,054
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



246,598
MERCURY REMOVING DEVICE FOR DENTAL AMALGAMATORS
Paul Merlin Morrison, 9004 Copenhaver Drive, Potomac, Md. 20854
Filed Jan. 2, 1976, Ser. No. 646,111
Term of patent 14 years
Int. Cl. D23—*04;* D24—*01*
U.S. Cl. D24—1.1

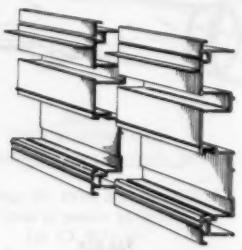




246,599
PULMONARY DIAGNOSTIC INSTRUMENT UNIT
Michael V. Ward, Creve Coeur; Allen D. Penniman, Jr., Glendale, and Richard E. Pikul, De Soto, all of Mo., assignors to Puritan-Bennett Corporation, St. Louis, Mo.
Filed July 28, 1975, Ser. No. 599,896
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

246,600
TEST TUBE
Motoji Kurata, Hatsukaichi, Japan, assignor to Japan Medical Supply Co., Ltd.
Filed Nov. 5, 1975, Ser. No. 629,043
Claims priority, application Japan, May 6, 1975, 50-17460
Term of patent 7 years
Int. Cl. D24—*02*
U.S. Cl. D24—56

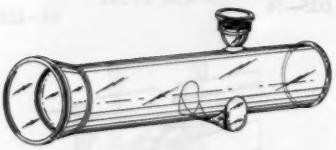
246,601
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 5, 1976, Ser. No. 673,432
Claims priority, application Canada, Oct. 10, 1975, 10-10-75-6
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



246,602
CIGARETTE HOLDER
Charles W. Frost, 1788A Spanish Trail, Columbia, S.C. 29210
Filed Dec. 2, 1975, Ser. No. 637,067
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—2

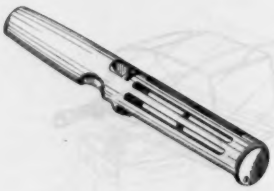
246,603
SMOKING PIPE
Charles W. Frost, 1788A Spanish Trail, Columbia, S.C. 29210
Filed Dec. 2, 1975, Ser. No. 637,045
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—3

246,604
SMOKING PIPE
Charles W. Frost, 1788A Spanish Trail, Columbia, S.C. 29210
Filed Dec. 2, 1975, Ser. No. 637,046
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—3



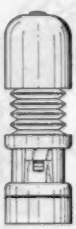
246,605
PORTABLE HAIR DRYER
Morison S. Cousins, Plainview, and Michael A. Cousins, Huntington, both of N.Y., assignors to The Gillette Company, Boston, Mass.
Filed Apr. 1, 1976, Ser. No. 672,788
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

246,606
STYLER HANDLE
Morison S. Cousins, Plainview; Michael A. Cousins, Huntington, both of N.Y., and Greydon A. Rhodes, III, Noroton, Conn., assignors to The Gillette Company, Boston, Mass.
Filed Apr. 1, 1976, Ser. No. 672,787
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—18

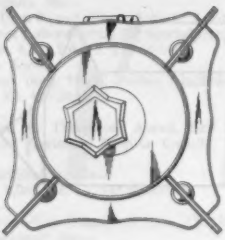


246,607
PENDANT OR THE LIKE
Michael R. Radisich, 3209 N. County Road 25, Loveland, Colo. 80537
Filed Apr. 8, 1976, Ser. No. 674,904
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D31—21.3

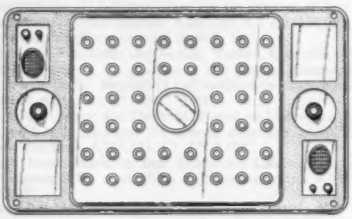
246,608
DOLL
Yoshizo Nagasaka, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Sept. 17, 1976, Ser. No. 724,070
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



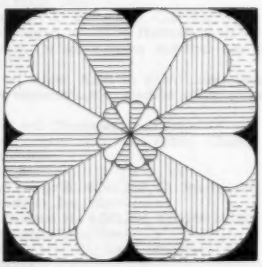
246,609
GAME BOARD
Hideyuki Kanno, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jan. 13, 1976, Ser. No. 648,636
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



246,610
ELECTRICAL CIRCUIT GAME BOARD
Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Apr. 15, 1976, Ser. No. 677,125
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS

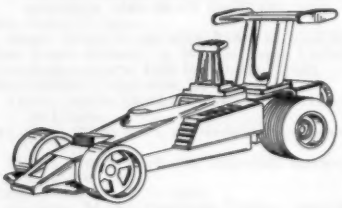


246,611
GAME TARGET
Henry C. Noyes, Jr., 8117 Blairton Road, and C. March Miller, 6330 Alberta St., both of Springfield, Va. 22152
Filed Mar. 17, 1976, Ser. No. 666,861
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 PP



246,612
SKI POLE GRIP OR SIMILAR ARTICLE
Frank A. Hosick, Vashon, Wash., assignor to K-2 Corporation, Vashon, Wash.
Filed July 1, 1976, Ser. No. 701,593
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D

246,613
TOY RACING CAR
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 25, 1976, Ser. No. 689,949
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

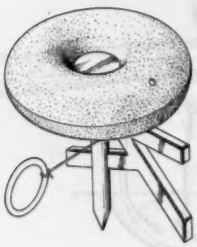


246,614

SIMULATIVE TOY TOP

Ray W. Johnson, Wichita, Kans., assignor to David L. Gordon, Wichita, Kans., a part interest

Filed June 4, 1976, Ser. No. 693,132
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 BB

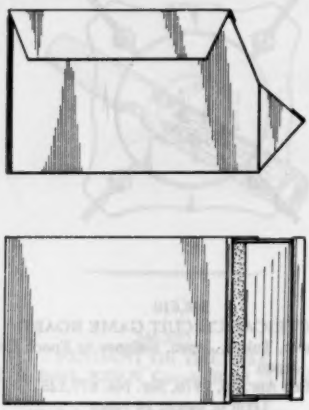


246,615

COMBINED STORAGE AND SHIPPING CONTAINER

Benjamin A. Downing, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 1, 1976, Ser. No. 662,486
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D87—1 R



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PATENTS WERE ISSUED ON THE 6TH DAY OF DECEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Moschovis, Elias P.; and Gilson, John L., 4,061,582, Cl. 252-62.10L.

A/S Apothekernes Laboratorium for Specialpraeparater: *See*—
Hall, Gunnar, 4,061,568, Cl. 210-44.000.

A/S Cheminova: *See*—
Madsen, Hans Berg; Holst, Preben Lindholm; and Solli, Houk, 4,061,757, Cl. 424-263.000.

AB Kabi: *See*—
Af Ekenstam, Bo Thuresson; Aurell, Leif Eric; Claeson, Karl Goran; and Karlsson, Birgitta Gunilla, 4,061,625, Cl. 260-112.50R.

AB Svenska Flaktfabriken: *See*—
Ljung, Ake, 4,061,186, Cl. 165-59.000.

AB Volvo: *See*—
Ternehall, Runo Roy Oskar, 4,061,214, Cl. 188-277.000.

AB Westin & Backlund: *See*—
Sundstrom, Nils Eskil, 4,061,080, Cl. 92-13.200.

Abbas, Shakir Ahmed; and Dockerty, Robert Charles, to International Business Machines Corporation. Field effect transistor structure and method for making same. 4,062,040, Cl. 357-54.000.

Abbott Laboratories: *See*—
Crovetti, Aldo Joseph; and Stein, Robert George, 4,061,764, Cl. 424-275.000.

ABU Aktiebolag: *See*—
Karlsson, Jarding Urban; and Svensson, Hugo Ragnvald, 4,061,288, Cl. 242-84.10K.

Acheson Industries, Inc.: *See*—
Clary, Jerome Francis; Wiley, Robert Emerson; and Bowns, Richard Earl, 4,061,601, Cl. 252-511.000.

Acme Engineering and Manufacturing Corporation: *See*—
Bohanon, Hoy R., 4,061,131, Cl. 126-271.000.

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Pospisil, Frantisek; and Sedlak, Vaclav, 4,060,882, Cl. 29-132.000.

Adolphi, Heinrich; Fleig, Helmut; and Hagen, Helmut, to BASF Aktiengesellschaft. Naphth-[2,1-d]-isothiazole and nematocidal uses thereof. 4,061,762, Cl. 424-270.000.

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Aerwey Laboratories, Inc.: *See*—
Thornwald, Everett D., 4,061,698, Cl. 261-78.00A.

Af Ekenstam, Bo Thuresson; Aurell, Leif Eric; Claeson, Karl Goran; and Karlsson, Birgitta Gunilla, to AB Kabi. Novel chromogenic thrombin substrates. 4,061,625, Cl. 260-112.50R.

Affa, Stephen N. Connector. 4,061,366, Cl. 285-37.000.

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Kobayashi, Yoshinari; Matuo, Ryukichi; and Nishiyama, Masashi, 4,061,567, Cl. 210-40.000.

AGFA-Gevaert Aktiengesellschaft: *See*—
Himmelmann, Wolfgang, 4,061,499, Cl. 96-111.000.
Leuchter, Jurgen, 4,060,873, Cl. 15-256.500.
Pfeifer, Josef; Rheude, Alfred; and Muller, Jurgen, 4,061,915, Cl. 250-315.00A.

AGFA-Gevaert, N.V.: *See*—
Monbaliu, Marcel Jacob; Mannens, Marc Godfried; Van Poucke, Raphael Karel; Credner, Hans-Heinrich; and Meier, Ernst, 4,061,498, Cl. 96-100.00R.

Agren, Carl Hugo: *See*—
Stetson, Karl A.; and Agren, Carl Hugo, 4,061,068, Cl. 84-275.000.

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Kashmer, James C.; and Tobin, Charles R., 4,061,160, Cl. 137-637.200.

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Foster, George B., 4,061,297, Cl. 244-184.000.

Airheart Products, Inc.: *See*—
Wood, William H., 4,061,206, Cl. 188-26.000.

Airpax Electronics, Inc.: *See*—
Harper, George S.; and Merriken, Lyal N., 4,062,052, Cl. 361-28.000.

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Ishikawa, Kazuo, 4,061,215, Cl. 192-4.00A.
Kitamura, Kazuhiko, 4,061,265, Cl. 236-48.00R.

Aizawa, Hiroshi: *See*—
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,062,028, Cl. 354-152.000.
Tsunekawa, Tokuichi; Uchidoi, Masanori; Shimizu, Masami; Yamamichi, Masayoshi; Murayama, Keiya; and Aizawa, Hiroshi, 4,062,024, Cl. 354-60.00R.

Akagawa, Masataka: *See*—
Yokoi, Hiroshi; and Akagawa, Masataka, 4,062,018, Cl. 343-754.000.

Akase, Sigeyuki: *See*—
Yokokawa, Takao; Kanazawa, Shogo; Otoguro, Yasuo; Suzuki, Nobukazu; Akase, Sigeyuki; Miida, Noboru; Akazawa, Tadahisa; and Kuroiwa, Kazuya, 4,061,494, Cl. 75-124.000.

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Yokokawa, Takao; Kanazawa, Shogo; Otoguro, Yasuo; Suzuki, Nobukazu; Akase, Sigeyuki; Miida, Noboru; Akazawa, Tadahisa; and Kuroiwa, Kazuya, 4,061,494, Cl. 75-124.000.

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Eriksoo, Edgar; and Ohlsson, Korfitz Bengt-Ingvar, 4,061,747, Cl. 424-244.000.

Akzona Incorporated: *See*—
McCulloch, Walter Graham, 4,061,804, Cl. 428-17.000.

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Sivilotti, Olivo Giuseppe, 4,061,177, Cl. 164-87.000.
Sivilotti, Olivo Giuseppe; Steer, David Edward; and Stock, Thomas Adrian Cheetham, 4,061,178, Cl. 164-87.000.
Stock, Thomas Adrian Cheetham; Dougan, Patrick Daniel; and Sivilotti, Olivo Guiseppe, 4,061,010, Cl. 72-201.000.

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Ivanova, Raisa Vasilievna; Belsky, Arkady Andreevich; Novikov, Nikolai Alexandrovich; Alexeeva, Nina Nikolaevna; Nikitina, Ljudmila Nikolaevna; Ljubimova, Nina Andreevna; and Dotsenko, Anna Evgenievna, 4,061,551, Cl. 204-105.00R.

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Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.

Allen, Robert K.: *See*—
Meyer, Burton C.; and Allen, Robert K., 4,060,929, Cl. 46-11.000.

Allen, Roger Anthony, to Wiggins Teape Limited. Coating and smoothing apparatus. 4,061,109, Cl. 118-118.000.

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Lazarus, Stanley David; and Newland, Julian Harold, 4,061,708, Cl. 264-211.000.
Lofquist, Robert Alden; and Haylock, John Christopher, 4,061,621, Cl. 260-78.00L.
Minhas, Pritam Singh; and Sukornick, Bernard, 4,061,810, Cl. 428-85.000.

Allison, William Woodrow: *See*—
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Allmendinger, Norbert, to Richmond Industries, Inc. Wrench and method of making the same. 4,061,507, Cl. 148-12.00R.

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Stern, Donald J.; and Allsop, Jon I., 4,061,347, Cl. 280-11.37H.

Allsop, Jon I.: *See*—
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Altenburg, Dieter: *See*—
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Alyea, Harold W.: *See—*
Ley, Ralph M., Jr.; Alyea, Harold W.; and Holloway, Thomas M., 4,061,266, Cl. 236-49.000.

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Morris, Kent C.; Bonsen, Pieter; and Laver, Myron B., 4,061,736, Cl. 424-177.000.

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Revell, Alan E., 4,061,373, Cl. 292-251.000.
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Adam, Alberto Eilert, 4,061,751, Cl. 424-250.000.
Boatright, Alfonso, 4,061,740, Cl. 424-202.000.
Conrow, Ransom Brown; Bernstein, Seymour; and Bauman, Norman, 4,061,627, Cl. 260-178.000.
Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; Grudzinskas, Charles Vincent; and Lai Chen, Sow-Mei, 4,061,670, Cl. 260-514.00D.
Floyd, Middleton Brawner, Jr.; McGahren, William James; Schaub, Robert Eugene; and Weiss, Martin Joseph, 4,061,672, Cl. 260-514.00D.
Goldstein, Marvin Sherwood; Lindsley, John Francis; Allison, William Woodrow; and Price, Charles Dan, 4,061,597, Cl. 252-465.000.
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Hoffman, John Ronald; and Marsland, Peter John, 4,060,885, Cl. 29-407.000.
Oberstar, Helen Elizabeth; and Westman, Morton Alan, 4,061,602, Cl. 252-547.000.

American Home Products Corporation: *See—*
Alburn, Harvey E.; Lien, Eric L.; and Grant, Norman H., 4,061,737, Cl. 424-177.000.
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Eitzen, Vincent Elliott; and Moore, Robert Rockwell, 4,061,315, Cl. 366-111.000.

American Safety Equipment Corporation: *See—*
Miller, David D., 4,060,867, Cl. 9-313.000.

AMI Industries, Inc.: *See—*
Reida, William D., 4,061,396, Cl. 297-283.000.

AMP Incorporated: *See—*
Dechelette, Helen; and Joly, Jean Claud, 4,060,890, Cl. 29-628.000.
Kunkle, John Philip, 4,061,406, Cl. 339-47.00C.

Ampex Corporation: *See—*
Weber, Donald William, 4,062,048, Cl. 360-72.000.

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Doshi, Niranjan Kumar, 4,061,445, Cl. 418-54.000.

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Shultz, Gilbert F.; and Bailey, Ronald W., 4,060,997, Cl. 62-180.000.

Applied Materials, Inc.: *See—*
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Maxel, John M., 4,061,817, Cl. 428-246.000.

Armstrong Cork Company: *See—*
Dieck, Ronald Lee; and Quinn, Edwin John, 4,061,606, Cl. 260-2.50R.
George, Jay R.; Line, Larry L.; and Reed, David H., 4,061,516, Cl. 156-94.000.

Armstrong, Lee R.: *See—*
Goodfriend, Harvey J.; Mercik, Henry J., Jr.; and Armstrong, Lee R., 4,061,026, Cl. 73-116.000.
Willenbecher, James F.; and Armstrong, Lee R., 4,061,025, Cl. 73-116.000.

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Modell, Michael, 4,061,566, Cl. 210-32.000.

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Hayano, Fusakazu; Hashino, Yasuo; and Ichikawa, Kiyoshi, 4,061,821, Cl. 428-304.000.

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Hannauer, George; and Asthana, Abhaya, 4,061,904, Cl. 364-608.000.

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Krasin, Thomas L., 4,061,911, Cl. 362-20.000.

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Auracher, Franz: *See—*
Zeidler, Guenter; and Auracher, Franz, 4,062,043, Cl. 358-86.000.

Aurell, Leif Eric: *See—*
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Pryor, Joseph E., 4,061,195, Cl. 172-456.000.

Austin, Oliver K., to Phillips Petroleum Company. Carbon black pelleter. 4,061,316, Cl. 366-303.000.

Austin, Stephen R.; and Stevenson, George J., to Brevet Corporation, The. Forklift truck. 4,061,237, Cl. 214-515.000.

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Bardet, Gerard, 4,061,451, Cl. 425-66.000.

Avco Everett Research Laboratory, Inc.: *See—*
Gay, Gardiner, 4,061,944, Cl. 313-420.000.

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Fredriksson, Rune Osten Walter; Johansson, Johan Ingvar; and Boye, Erhard Rudolf, 4,061,261, Cl. 228-2.500.

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Ayers, Orval E.: *See—*
Chew, William M.; Ayers, Orval E.; Murfree, James A.; and Martignoni, Pasquale, 4,061,512, Cl. 149-22.000.

B. F. Goodrich Company, The: *See—*
Davy, David Larry, 4,061,213, Cl. 188-181.00R.
Lantz, Charles Hunter, 4,061,404, Cl. 303-118.000.

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Durrant, Oliver W., 4,061,533, Cl. 176-20.00R.
Nolan, John Howard; Goddard, Donald Lawrence; and Short, Barrett John, 4,061,535, Cl. 176-38.000.

Babej, Milos: *See—*
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Babunovic, Momir, to Barry-Wehmiller Company. Container washing apparatus. 4,061,152, Cl. 134-73.000.

Baczuk, Robert J., to United States of America, Navy. Aluminum silicate stabilizer in gas producing propellants. 4,061,511, Cl. 149-19.900.

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vich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.

Bagne, Gordon, to Plasticolor Molded Products, Inc. Mud guard. 4,061,352, Cl. 280-154.50R.

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Baker, Roger Thomas. Dynamic content addressable semiconductor memory. 4,062,001, Cl. 365-49.000.

Bakkeren, Hans Adolf. Device for transporting unstable stacks of sheetlike materials. 4,061,084, Cl. 100-1.000.

Baldwin, William I.; and Buchele, Wesley F., to Iowa State University Research Foundation, Inc. Recording soil penetrometer. 4,061,021, Cl. 73-84.000.

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Milne, James, 4,060,953, Cl. 52-743.000.

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Tai, Wun Ten; Mura, Lawrence A.; Phillips, Kenneth G.; and Ballweber, Edward G., 4,061,695, Cl. 260-929.000.

Bangle, Roger L. Removable skateboard handle post. 4,061,351, Cl. 280-87.04A.

Banner, Philip M. Marine water inlet device. 4,061,571, Cl. 210-130.000.

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Barbe, Gerard; and Deyres, Andre, to Rhone-Poulenc Textiles. Polyester fibers having wool-like hand and process for producing same. 4,060,968, Cl. 57-140.0BY.

Barber, Alfred William. Timing circuit for incremental actuators. 4,061,951, Cl. 318-443.000.

Barclay, Robert: *See*—
Bertozzi, Eugene R.; Hoffman, Robert F.; and Barclay, Robert, 4,061,612, Cl. 260-31.40R.

Bard Laboratories, Inc.: *See*—
Quast, Kenneth J., 4,061,831, Cl. 428-480.000.
Yundt, Albert P., 4,061,836, Cl. 428-537.000.

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Bantien, Jurgen; Bardenhagen, Dietrich; Mielke, Johannes; and Kruse, Friedel, 4,061,234, Cl. 214-6.00M.

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Barker, Gerald C., to Coherent Radiation. Soft power supply for pulsed laser. 4,061,986, Cl. 331-94.5PE.

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Lorenz, Hellmut, 4,060,967, Cl. 57-77.450.

Barnes, Derek, to MacMillan Bloedel Limited. Products of converted lignocellulosic materials. 4,061,819, Cl. 428-294.000.

Barreto, Albert: *See*—
Muir, Larry A.; and Barreto, Albert, 4,061,732, Cl. 424-117.000.

Barron, Lee H., Sr. Glass beveling machine. 4,060,938, Cl. 51-110.000.

Barrons, Morris R. Citizen band radio mount. 4,061,971, Cl. 325-15.000.

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Babunovic, Momir, 4,061,152, Cl. 134-73.000.

Bart, Evgeny Vasilievich; Batalin, Oleg Efimovich; Troitsky, Andrian Petrovich; Skachkova, Nina Andreevna; Lebedev, Vladimir Mikhailovich; and Trifonova, Rimma Petrovna. Method of producing high-boiling byproducts of isoprene production. 4,061,680, Cl. 260-606.000.

Bartels, Werner; and Krakow, Heinz, to Blohm & Voss AG. Method for producing helical seam pipes. 4,061,264, Cl. 228-145.000.

Barter, James A., to PPG Industries, Inc. Tertiary-alkylperoxy alkyl carbonate initiators for hot air vulcanization of silicone rubber. 4,061,704, Cl. 264-83.000.

Bartmann, Wilhelm; Kunstmann, Rudolf; Lerch, Ulrich; and Scholkens, Bernward, to Hoechst Aktiengesellschaft. Cyclopentane derivatives and process for preparing them. 4,061,766, Cl. 424-279.000.

Bartmann, Wilhelm: *See*—
Teufel, Hermann; Bartmann, Wilhelm; Granzer, Ernold; and Musil, Josef, 4,061,772, Cl. 424-304.000.

Barud, Sigvard: *See*—
Kvaerna, Sverre; and Barud, Sigvard, 4,061,324, Cl. 269-325.000.

BASF Aktiengesellschaft: *See*—
Adolphi, Heinrich; Fleig, Helmut; and Hagen, Helmut, 4,061,762, Cl. 424-270.000.
Kahr, Kurt; Pohl, Hanns; Rapp, Guenther; and Lauz, Peter, 4,061,677, Cl. 260-566.00A.
Muenster, Alfred, 4,061,849, Cl. 526-68.000.
Ohlinger, Manfred; Schoenafinger, Eduard; Schneider, Walter; Stritzinger, Heinz; and Vaeth, Guenter, 4,061,725, Cl. 423-634.000.
Ohlinger, Manfred; Schoenafinger, Eduard; Vaeth, Guenter; Stritzinger, Heinz; Koester, Eberhard; Schneehage, Hans Henning; and Steck, Werner, 4,061,726, Cl. 423-634.000.
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Vaeth, Guenter; Ohlinger, Manfred; Stritzinger, Heinz; Schoenafinger, Eduard; Wettstein, Eugen; and Guth, Wolfgang, 4,061,727, Cl. 423-634.000.
Wild, Hans; Jung, Rudolf; Echte, Adolf; Zizlsperger, Johann; and Gausepohl, Hermann, 4,061,858, Cl. 526-67.000.

BASF Wyandotte Corporation: *See*—
Helfert, Herbert; Langdon, William Keith; and Davis, Pauls, 4,061,684, Cl. 260-615.00B.

Bass, Merlyn Duane: *See*—
Raisbeck, Wesley Paul; Bass, Merlyn Duane; Whicker, Bobbie Dean; Davis, William Clair; and Fairbank, Raymond Harry, 4,061,284, Cl. 241-294.000.

Bast, Kenneth D.; and Kennelly, Jerauld M., to Minnesota Mining and Manufacturing Company. Connector for a plate electrode. 4,061,408, Cl. 339-75.00R.

Batalin, Oleg Efimovich: *See*—
Bart, Evgeny Vasilievich; Batalin, Oleg Efimovich; Troitsky, Andrian Petrovich; Skachkova, Nina Andreevna; Lebedev, Vladimir Mikhailovich; and Trifonova, Rimma Petrovna, 4,061,680, Cl. 260-606.000.

Batchelor, Phillip J.; Traister, Robert L.; Gray, Gary A.; and Marino, Joseph A., to Xerox Corporation. Error log for electrostatographic machines. 4,062,061, Cl. 364-900.000.

Battle, Francis L., to Gulf & Western Industries, Inc. Digital traffic coordinator. 4,061,902, Cl. 364-436.000.

Battle, Francis L., to Gulf & Western Industries, Inc. Digital coordinator with smooth transition for offset changes. 4,061,903, Cl. 364-436.000.

Bauer, Gilbert: *See*—
Noel, Jean Pierre; and Bauer, Gilbert, 4,061,016, Cl. 73-60.100.

Bauer, Lawrence H.: *See*—
Leto, Armetia E.; and Bauer, Lawrence H., 4,060,932, Cl. 46-116.000.

Bauerkemper, Michael I., to International Telephone and Telegraph Corporation. Method and apparatus for terminating a fiber optic bundle. 4,061,522, Cl. 156-305.000.

Baughman, Ray M.: *See*—
Nelson, Rodney L., 4,061,399, Cl. 299-18.000.

Bauman, Norman: *See*—
Conrow, Ransom Brown; Bernstein, Seymour; and Bauman, Norman, 4,061,627, Cl. 260-178.000.

Baumgartel, Karl Heinz; Altenburg, Dieter; and Hase, Siegfried, to Licentia Patent-Verwaltungs-G.m.b.H. Roller conveyor. 4,061,332, Cl. 271-270.000.

Baumgartner, Hans Ulrich: *See*—
Witzke, Gunther; and Baumgartner, Hans Ulrich, 4,061,035, Cl. 73-406.000.

Baxter, Gerald M., to Redimix Beverages Limited. Beverage package cup. 4,061,782, Cl. 426-86.000.

Baxter Travenol Laboratories, Inc.: *See*—
Leonard, Ronald J., 4,061,470, Cl. 23-258.50M.

Bayer Aktiengesellschaft: *See*—
Becker, Wolf-Jurgen; Breuer, Wolfram; and Siemer, Klaus, 4,061,467, Cl. 23-232.00R.
Brauner, Dieter; Kaluza, Hans-Joachim; and Muschelknautz, Edgar, 4,061,313, Cl. 366-340.000.
Horstmann, Harald; Meng, Karl; and Wehinger, Egbert, 4,061,653, Cl. 548-360.000.
Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, 4,061,697, Cl. 260-944.000.
Knofel, Hartmut; and Ellendt, Gunther, 4,061,678, Cl. 260-570.00D.
Margotte, Dieter; and Vernaleken, Hugo, 4,061,691, Cl. 260-860.000.

BBC Brown, Boveri & Company Limited: *See*—
Gillhaus, Horst, 4,061,179, Cl. 164-151.000.

Bealmear, Herbert Shipley. Releasable locking means for two part electric connector. 4,061,409, Cl. 339-75.00P.

Bean, Charles P.; King, Roy J., Jr.; and Uzgiris, Egidijus E., to General Electric Company. Bioassay for drugs and antibiotics. 4,061,543, Cl. 195-103.50K.

Beck, Gerhard; Kunstmann, Rudolf; Babej, Milos; and Teufel, Hermann, to Hoechst Aktiengesellschaft. Analogues of prostaglandins. 4,061,671, Cl. 260-514.00D.

Beck, Harold D., to International Harvester Company. Fan shroud structure. 4,061,188, Cl. 165-122.000.

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Beckett Corporation: *See*—
Clark, Anthony W.; and Stubbs, Rex G., Jr., 4,061,442, Cl. 417-36.000.

Beckmann, Robert Martin: *See*—
Reimers, Fred Alan; Beckmann, Robert Martin; Burzynski, William Arthur; Tomlinson, Dennis Eugene; and Schwartz, William Henry, 4,061,973, Cl. 325-17.000.

Bedague, Pierre: *See*—
Leleu, Gerard; Bedague, Pierre; and Sillion, Bernard, 4,061,581, Cl. 252-32.70E.

Beecham Group Limited: *See*—
Howarth, Thomas Trefor, 4,061,649, Cl. 260-307.0FA.
Lake, Anthony William; and Rose, Carl John, 4,061,779, Cl. 424-331.000.

Beekenkamp, Gerald, to Black and Decker Manufacturing Company, The. Foldable, portable support stand. 4,061,305, Cl. 248-432.000.

Beekenkamp, Gerald, to Black and Decker Manufacturing Company,

The. Workpiece supporting and clamping apparatus. 4,061,323, Cl. 269-139.000.

Beer, Irwin B.; and Siegal, Sanford. Tennis ball holder to be worn on the arm. 4,061,256, Cl. 224-5.00D.

Behringwerke Aktiengesellschaft: *See*—
Seiler, Fritz; and Schwarzbeck, Andreas Michael, 4,061,537, Cl. 195-1.700.
Weiler, Herbert; Schneider, Hans; Von Janecek, Wolfgang; and Weyrich, Ludwin, 4,060,911, Cl. 34-5.000.

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Adrian, James Mark, 4,061,884, Cl. 179-18.0GF.
Beurrier, Henry Richard, 4,061,049, Cl. 74-424.80R.
Cordell, Robert Roger, 4,061,932, Cl. 307-360.000.
Kubik, Peter Steve, 4,061,410, Cl. 339-113.00B.
Scull, Harvey Ronald, 4,062,047, Cl. 360-26.000.
Taylor, Gary Newton, 4,061,829, Cl. 428-451.000.

Belliere, Pierre A., to Ratier-Forest. Device for controlling the variation in pitch of the blades of a fan. 4,061,440, Cl. 416-157.00R.

Bellus, Daniel: *See*—
Greuter, Hans; and Bellus, Daniel, 4,061,644, Cl. 260-296.00R.

Belsky, Arkady Andreevich: *See*—
Ivanova, Raisa Vasilievna; Belsky, Arkady Andreevich; Novikov, Nikolai Alexandrovich; Alexeeva, Nina Nikolaevna; Nikitina, Ljudmila Nikolaevna; Ljubimova, Nina Andreevna; and Dotsenko, Anna Evgenievna, 4,061,551, Cl. 204-105.00R.

Benda, David; and Davis, Charles A., to GTE Sylvania Incorporated. Shielded getter support on rotor-supported antenna. 4,061,945, Cl. 313-481.000.

Benjamin, Joseph Reginald. Drilling rigs. 4,061,233, Cl. 214-2.500.

Bennett, Henry J., to Burdett Manufacturing Company. Combustion system and method. 4,061,463, Cl. 431-9.000.

Bennett, John A.; McAllister, Ian R.; and Welsh, Howard. Oil recovery apparatus and method. 4,061,569, Cl. 210-83.000.

Berg, Albert T., Jr.; and Langlie, Howard. Corner insulator for electric fences. 4,061,873, Cl. 174-208.000.

Berger, Sidney Ethan; and Salensky, George Anthony, to Union Carbide Corporation. Silane treatment of titanium dioxide pigment. 4,061,503, Cl. 106-300.000.

Berglein, Adolf: *See*—
Lachnit, Wolfgang, 4,060,955, Cl. 52-749.000.

Berglund, Kurt, to Siemens Aktiengesellschaft. Circuit arrangement for the frequency analysis of a signal. 4,062,020, Cl. 346-33.00R.

Berkey-Colortran, Inc.: *See*—
Levasseur, Craig, 4,061,912, Cl. 362-287.000.

Bernard, Jean-Rene; Bousquet, Jacques; and Grand, Michel, to Societe Nationale Elf Aquitaine. Method of catalytic conversion of butane. 4,061,690, Cl. 260-676.00R.

Bernard, Vincent E., to Jimmy Dean Meat Company, Inc., The. Portion controlled frozen food. 4,060,998, Cl. 62-320.000

Bernstein, Jacob. Toe protector and foot support for an orthopedic cast. 4,061,138, Cl. 128-82.000.

Bernstein, Seymour: *See*—
Conrow, Ransom Brown; Bernstein, Seymour; and Bauman, Norman, 4,061,627, Cl. 260-178.000.

Bertozzi, Eugene R.; Hoffman, Robert F.; and Barclay, Robert, to Thiokol Corporation. Low temperature plasticizers for specialty rubbers consisting of diesters of dicarboxylic acids with hexyloxyethoxyethanol or butoxyethoxyethoxyethanol. 4,061,612, Cl. 260-31.40R.

Beurrier, Henry Richard, to Bell Telephone Laboratories, Incorporated. Mechanism for changing linear motion to substantially pivotal motion. 4,061,049, Cl. 74-424.80R.

Beyler, Roland. Process for reducing the pollution due to an internal combustion engine, and an engine including the application of said process. 4,061,113, Cl. 123-26.000.

Bias, Arnett, to Bait Guard Inc. Fishing bobber and bait guard. 4,060,925, Cl. 43-41.200.

Bicking, John B.: *See*—
Cragoe, Edward J., Jr.; and Bicking, John B., 4,061,643, Cl. 260-295.00R.

Bierwagen, Gordon Paul: *See*—
Glowaky, Raymond Charles; Rudolph, Stephen Edward; and Bierwagen, Gordon Paul, 4,061,610, Cl. 260-17.4ST.
Glowaky, Raymond Charles; Rudolph, Stephen Edward; and Bierwagen, Gordon Paul, 4,061,611, Cl. 260-17.4ST.

Binder, Volker: *See*—
Schwarze, Werner; Merk, Wolfgang; and Binder, Volker, 4,061,869, Cl. 526-1.000.

Biondetti, Mario, to Escher Wyss GmbH. Adjustable suction device for a paper machine. 4,061,532, Cl. 162-352.000.

Biorex Laboratories Limited: *See*—
Chan, Rosalind Po Kuen, 4,061,773, Cl. 424-313.000.

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Jones, Ivor Wynn; Robinson, Graham; and Bird, Thomas Lewis, 4,061,840, Cl. 429-104.000.

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Biron, Richard D., to Seagull Industries, Inc. Portable oil-water separation apparatus. 4,061,573, Cl. 210-282.000.

Bissett, Thomas B. Roll stabilizer for boats. 4,061,102, Cl. 114-122.000.

Black and Decker Manufacturing Company, The: *See*—
Beekenkamp, Gerald, 4,061,305, Cl. 248-432.000.
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DeWitt, Erik John, deceased, 4,060,940, Cl. 51-170.0PT.

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Black, Frank M. Absorber-contactor. 4,060,912, Cl. 34-9.000.

Black, Robin Michael, to John Wyeth & Brother Limited. Imidazo[1,2-a]quinolines. 4,061,754, Cl. 424-258.000.

Blahak, Johannes: *See*—
Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, 4,061,697, Cl. 260-944.000.

Blasetti, David H. Apparatus for generating forces in a specimen. 4,061,019, Cl. 73-662.000.

Blessing, Hubert. Folding apparatus. 4,061,327, Cl. 270-78.000.

Blevins, Bascom D.: *See*—
Schmidt, Ernest J., Jr.; Rinehart, Michael G.; and Blevins, Bascom D., 4,061,350, Cl. 280-87.04A.

Block, Leo: *See*—
Ashton, Larry; and Block, Leo, 4,061,132, Cl. 126-271.000.

Blohm, Thomas R.; Grisar, J. Martin; and Wiech, Norbert L., to Richardson-Merrell Inc. Lactamimide inhibitors of gastrointestinal hypersecretion. 4,061,746, Cl. 424-244.000.

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Bartels, Werner; and Krakow, Heinz, 4,061,264, Cl. 228-145.000.

Blomberg, Folke Ivar. Rotational rate of change sensor. 4,061,212, Cl. 188-181.00A.

Blomberg Glass: *See*—
Cardoso, LeRoy A., 4,061,372, Cl. 292-207.000.

Blomstrom, Gary D., to Caterpillar Tractor Co. Shock mounted tilting operator platform. 4,061,393, Cl. 296-28.00C.

Bloomfield, Harvey S., to United States of America, National Aeronautics and Space Administration. In-situ laser retorting of oil shale. 4,061,190, Cl. 166-259.000.

Blum, John Tudor, to Cross Up, Inc. Structural unit for swingarms. 4,061,354, Cl. 280-288.000.

Blyakhman, Lazar Isaevich; Davydov, Sergei Lvovich; and Kashina, Valentina Fedorovna. Method of recovering primary and secondary amines. 4,061,633, Cl. 544-106.000.

Boatright, Alfonso, to American Cyanamid Company. Liquid compositions containing a polyethylene glycol safener and an organophosphorus pesticide. 4,061,740, Cl. 424-202.000.

Bobear, William J., to General Electric Company. Inhibitor for platinum catalyzed silicone rubber compositions. 4,061,609, Cl. 260-9.000.

Bodor, Nicolae S., to INTERx Research Corporation. Selected quaternary ammonium salts of pilocarpine useful in reducing intraocular pressure in warm-blooded animals. 4,061,722, Cl. 424-273.00R.

Bodor, Nicolae S.; and Sloan, Kenneth B., to INTERx Research Corporation. Treating psoriasis with transient pro-drug forms of xanthine derivatives. 4,061,753, Cl. 424-253.000.

Boehringer Mannheim GmbH: *See*—
Lange, Hans; Rittersdorf, Walter; Rey, Hans-Georg; Werner, Wolfgang; and Rieckmann, Peter, 4,061,468, Cl. 23-253.0TP.

Boeing Company, The: *See*—
Gupta, Alankar; and Fadden, Delmar M., 4,061,996, Cl. 340-27.00R.
Hansen, Karl A.; and Hendrickson, I. Glen, 4,061,007, Cl. 72-56.000.
Somm, Paul T., 4,061,295, Cl. 244-104.0FP.

Bohanon, Hoy R., to Acme Engineering and Manufacturing Corporation. Heat transfer system particularly applicable to solar heating installations. 4,061,131, Cl. 126-271.000.

Bohme, Ekkehard: *See*—
Dolfini, Joseph E.; Bohme, Ekkehard; and Slusarchyk, William A., 4,061,629, Cl. 260-239.100.
Dolfini, Joseph Edward; and Bohme, Ekkehard, 4,061,851, Cl. 544-21.000.

Boileau, Jacques; and Mathevet, Albert, to Compagnie Generale des Etablissements Michelin. Nonreinforced tire. 4,061,171, Cl. 152-352.00R.

Bolger, Joseph Earl. Compensating mechanism. 4,061,050, Cl. 74-469.000.

Boller, Arthur: *See*—
Scherrer, Hanspeter; and Boller, Arthur, 4,061,587, Cl. 252-299.000.

Bondarenko, Oleg Petrovich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.

Bonsen, Pieter: *See*—
Morris, Kent C.; Bonsen, Pieter; and Laver, Myron B., 4,061,736, Cl. 424-177.000.

Boole, Leon J. Portable drawer assembly. 4,061,395, Cl. 297-192.000.

Boone, Terry. Mount. 4,061,302, Cl. 248-170.000.

Borcoman, Mircea. Factory-type apparatus for producing prestressed concrete products. 4,061,454, Cl. 425-88.000.

Boschert Associates: *See*—
Boschert, Robert J., 4,061,931, Cl. 307-300.000.

Boschert, Robert J., to Boschert Associates. Switching regulator power supply main switching transistor turn off speed up circuit. 4,061,931, Cl. 307-300.000.

Bose Corporation: *See*—
Froeschle, Thomas A., 4,061,890, Cl. 179-115.5VC.

Bott, Gerald J.; Porter, William C.; and Nowak, Terrance M. Bottle inspection apparatus. 4,061,014, Cl. 73-45.100.

Bottom, Virgil E.; and Christian, Robert E., to Tyco Filters Division, Inc. Method of improving ohmic contact through high-resistance oxide film. 4,060,888, Cl. 29-628.000.

Bouillon, Claude: *See*—
Kalopissis, Gregoire; Bouillon, Claude; and Vayssie, Charles, 4,061,730, Cl. 424-59.000.

Boulay, Henri A.: *See*—
Walker, William J.; and Boulay, Henri A., 4,061,282, Cl. 241-222.000.

Bourgery, Guy R.: *See*—
Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy R.; and Gouret, Claude J., 4,061,835, Cl. 544-122.000.

Bousquet, Jacques: *See*—
Bernard, Jean-Rene; Bousquet, Jacques; and Grand, Michel, 4,061,690, Cl. 260-676.00R.

Bowns, Richard Earl: *See*—
Clary, Jerome Francis; Wiley, Robert Emerson; and Bowns, Richard Earl, 4,061,601, Cl. 252-511.000.

Box, Theodor M. Mixing apparatus for feed to injection molding machine. 4,061,280, Cl. 241-101.600.

Boyd, William A.: *See*—
Brown, Lowell K.; Newman, William Albert; and Boyd, William A., 4,061,956, Cl. 320-22.000.

Boye, Erhard Rudolf: *See*—
Fredriksson, Rune Osten Walter; Johansson, Johan Ingvar; and Boye, Erhard Rudolf, 4,061,261, Cl. 228-2.500.

Boyer, Ernest Wendell; and Ingle, Morton Blakeman, to Miles Laboratories, Inc. Preparation of alkaline alpha-amylase. 4,061,541, Cl. 195-66.00R.

Brackett, Art H. Chord locater for fretted musical instrument. 4,061,069, Cl. 84-315.000.

Bradley, Frank R., to Bradley Telcom Corp. Instruments and methods for measuring characteristics of only a selected portion of a transmission channel. 4,061,892, Cl. 179-175.30R.

Bradley, Robert L.; and Sullivan, Daniel J., to General Signal Corporation. Fitting for penetration through fire rated barriers. 4,061,344, Cl. 277-26.000.

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Bradley, Frank R., 4,061,892, Cl. 179-175.30R.

Brakel, Kornelius, to Robert Bosch G.m.b.H. Hydraulic valve. 4,061,159, Cl. 137-596.000.

Bratzler, Karl: *See*—
Moller, Friedrich-Wilhelm; Bratzler, Karl; and Muller, Wolf-Dieter, 4,061,475, Cl. 48-197.00R.

Brault, Albert T.: *See*—
Wilkes, Glenn R.; and Brault, Albert T., 4,061,497, Cl. 96-77.000.

Brauner, Dieter; Kaluza, Hans-Joachim; and Muscheiknautz, Edgar, to Bayer Aktiengesellschaft. Apparatus for the static mixing of flowable substances. 4,061,313, Cl. 366-340.000.

Brazhnik, Viktor Yakovlevich: *See*—
Kaporovich, Vladimir Georgievich; Sereda, Viktor Grigorievich; Udovenko, Vitaly Kirillovich; Zelenskaya, Nadezhda Nikolaevna; Brazhnik, Viktor Yakovlevich; Sviridov, Evgeny Pavlovich; and Fabrichev, Jury Nikolaevich, 4,061,009, Cl. 72-69.000.

Breslow, Jeffrey D., to Marvin Glass & Associates. Board game apparatus. 4,061,335, Cl. 273-134.0AT.

Breuer, Wolfram: *See*—
Becker, Wolf-Jurgen; Breuer, Wolfram; and Siemer, Klaus, 4,061,467, Cl. 23-232.00R.

Brevet Corporation, The: *See*—
Austin, Stephen R.; and Stevenson, George J., 4,061,237, Cl. 214-515.000.

Brewer, Terry L., to Texas Instruments Incorporated. Method of patterning styrene diene block copolymer electron beam resists. 4,061,799, Cl. 427-43.000.

Bridgestone Cycle Industry Co., Ltd.: *See*—
Ohtsuka, Norio, 4,061,229, Cl. 206-486.000.

Brieaddy, Lawrence Edward: *See*—
Mehta, Nariman Bomanshaw; and Brieaddy, Lawrence Edward, 4,061,863, Cl. 560-18.000.

Bristol-Myers Company: *See*—
Kaplan, Murray A.; Gottstein, William J.; and Granatek, Alphonse P., 4,061,862, Cl. 544-27.000.

Brodnyan, John G.; Holloway, Donald F.; and Le Sota, Stanley, to Rohm and Haas Company. Crushed foam coated leather and leather-like materials. 4,061,822, Cl. 428-315.000.

Brooks & Perkins, Incorporated: *See*—
Jensen, Richard H.; and Parris, Peter P., 4,060,936, Cl. 49-465.000.

Brooksbank, Wallace Ronald; and Toft, David. Leather belts or aprons for textile machines. 4,061,803, Cl. 427-323.000.

Brosh, Aviel: *See*—
United States of America, National Aeronautics and Space Administration; Mateer, George C.; and Brosh, Aviel, 4,061,029, Cl. 73-180.000.

Brown, Dennis N. Apparatus for form fitting shoes and boots. 4,060,869, Cl. 12-115.200.

Brown, James D.; and Uraneck, Carl A., to Phillips Petroleum Company. Organocalciumpyridine-type polymerization initiators. 4,061,638, Cl. 260-270.00P.

Brown, Lowell K.; Newman, William Albert; and Boyd, William A., to Utah Research and Development Company. Electronic DC battery charger. 4,061,956, Cl. 320-22.000.

Brown, Roy William. Pneumatically operated conveyor systems for pulverulent or particulate materials. 4,061,401, Cl. 302-41.000.

Brownbill, Thomas Duncan, to John Dale Limited. Closure cap and container. 4,061,240, Cl. 215-270.000.

Brownlee, Robert O. Structural frame for a building. 4,060,948, Cl. 52-236.800.

Brucken, Byron L.: *See*—
Black, Dennis A.; and Brucken, Byron L., 4,061,443, Cl. 417-222.000.

Brush, John B., to Procter & Gamble Company, The. Rotary shear. 4,061,063, Cl. 83-55.000.

Bryant, A. William. Variable waveform synthesizer using digital circuitry. 4,061,909, Cl. 235-197.000.

Bryerton, John B., to Raymond Lee Organization Inc., a part interest. Water-powered dish scrubber. 4,060,871, Cl. 15-29.000.

Buchele, Wesley F.: *See*—
Baldwin, William L.; and Buchele, Wesley F., 4,061,021, Cl. 73-84.000.

Bucklitzsch, Hans H. Windshield wiper and washer. 4,060,872, Cl. 15-250.040.

Buendia, Jean: *See*—
Martel, Jacques; Buendia, Jean; and Vivat, Michel, 4,061,729, Cl. 424-305.000.

Bufler, Ernst, to Volkswagenwerk Aktiengesellschaft. Rear axle stabilizer. 4,061,362, Cl. 280-689.000.

Buhlmann, Siegfried: *See*—
Grebe, Wolfgang; and Buhlmann, Siegfried, 4,061,906, Cl. 364-735.000.

Buller, Richard James: *See*—
Anderson, John Dale; Buller, Richard James; and Trego, Allen Thomas, 4,060,961, Cl. 56-294.000.

Bunge, Ernst: *See*—
Rothgordt, Ulf; Ehlers, Bernd; Bunge, Ernst; and Piotrowski, Herbert, 4,062,014, Cl. 340-347.0DD.

Bunn, Dorrance P., Jr.: *See*—
Jones, Henry B.; and Bunn, Dorrance P., Jr., 4,061,162, Cl. 138-147.000.

Burckhardt, Christoph Benedikt; Grandchamp, Pierre-Andre; and Hoffmann, Heinz, to Hoffmann-La Roche Inc. Method and apparatus for distance measurement in an ultrasonics scanning image. 4,061,018, Cl. 73-629.000.

Burdett Manufacturing Company: *See*—
Bennett, Henry J., 4,061,463, Cl. 431-9.000.

Burg, Stanley P., to Grumman Allied Industries Inc. Low temperature hypobaric storage of metabolically active matter. 4,061,483, Cl. 62-268.000.

Burgess, Victor Robert. Short range induction field communication system. 4,061,972, Cl. 325-16.000.

Burnett, James E.: *See*—
Baehr, Edward F.; and Burnett, James E., 4,061,146, Cl. 128-305.000.

Burns, Arthur H., Jr., to Marlin Firearms Company, The. Method of straightening firearm barrels. 4,061,006, Cl. 72-34.000.

Burns, Robert A., to Engelhard Minerals & Chemicals Corporation. Production of sulfur recovery catalyst from bauxite fines. 4,061,595, Cl. 252-463.000.

Burroughs Corporation: *See*—
Dirks, Wolfgang Gerhard, 4,062,049, Cl. 360-78.000.

Burroughs, Viola F.; Vahl, Hasso G.; and Wahl, Harro W. D., to Hohbach, Harold C. Method for making an article having replicated coating with durable dielectric overcoat. 4,061,518, Cl. 156-232.000.

Burroughs Wellcome Co.: *See*—
Gorvin, John Henry, 4,061,768, Cl. 424-283.000.
Mehta, Nariman Bomanshaw; and Brieaddy, Lawrence Edward, 4,061,863, Cl. 560-18.000.

Burzynski, William Arthur: *See*—
Reimers, Fred Alan; Beckmann, Robert Martin; Burzynski, William Arthur; Tomlinson, Dennis Eugene; and Schwartz, William Henry, 4,061,973, Cl. 325-17.000.

Busch, Wolfram: *See*—
Schafer, Werner; Busch, Wolfram; Wallhausser, Hermann; Richter, Manfred; and Wilhelm, Siegfried, 4,061,710, Cl. 264-300.000.

Buss, Waldeen C., to Chevron Research Company. Hydrocarbon conversion catalyst. 4,061,592, Cl. 252-439.000.

Busse, Peter, to Richard Heinze. Detachable connector for structural members. 4,060,949, Cl. 52-285.000.

Butler, Donald E.: *See*—
Hastings, Stephen G.; Poschel, Bruno P. H.; and Butler, Donald E., 4,061,756, Cl. 424-263.000.

Butler Manufacturing Company: *See*—
Sandring, Albert W., 4,060,944, Cl. 52-43.000.

Butler, Robert W. Apparatus for producing rupture lines in flexible packages. 4,061,457, Cl. 425-385.000.

Buxton, Incorporated: *See*—
Friedman, Harvey William; and Corey, Donald Wyman, 4,060,854, Cl. 2-338.000.

Caldecott, Ross: *See*—
Young, Jonathan D.; and Caldecott, Ross, 4,062,010, Cl. 343-5.0NA.

Caldicott, Jack Richard, to Railweight Inc. (U.K.) Limited. Electronic weighing systems. 4,061,198, Cl. 177-50.000.

Caldwell, Donald Lee: *See*—
Hazelrigg, Mark Jonathan, Jr.; and Caldwell, Donald Lee, 4,061,549, Cl. 204-98.000.
Caliva, John. Automatic food roasting and basting device. 4,061,083, Cl. 99-345.000.
Callahan, Michael James, Jr.; and Hoffman, Gordon Bates, to Mostek Corporation. Dual tone multiple frequency generator. 4,061,886, Cl. 179-84.0VF.
Callender, William Boyd. Board game apparatus. 4,061,337, Cl. 273-134.0AT.
Callon, Floyd Raymond, to Heckethorn Manufacturing Co. Plastic pallet. 4,061,090, Cl. 108-51.100.
Calpis Shokuhin Kogyo Kabushiki Kaisha: *See*—
Inagami, Kaoru; Mitsui, Isamu; Nakamura, Chomatsu; and Nozaka, Toru, 4,061,792, Cl. 426-330.200.
Cameron, Donald L.: *See*—
Cameron, Tucson, 4,061,071, Cl. 84-455.000.
Cameron, Tucson, to Cameron, Donald L. Stroboscopic tuning device for musical instruments. 4,061,071, Cl. 84-455.000.
Campbell, Donald E. Hunting stand. 4,061,202, Cl. 182-20.000.
Campbell, Roy E.; Lawrence, John B.; and Tonne, Ronald Ray, to Ortloff Corporation, The. Natural gas processing. 4,061,481, Cl. 62-29.000.
Canada Square Management Ltd.: *See*—
Faiczak, John, 4,061,185, Cl. 165-48.000.
Canale, Romolo. Sole structure particularly for climbing-boots. 4,060,917, Cl. 36-59.00C.
Cannarella, Anthony. Toothpaste administering automatic toothbrush. 4,060,870, Cl. 15-24.000.
Canon Kabushiki Kaisha: *See*—
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Mashaharu; and Shinoda, Nobuhiko, 4,062,022, Cl. 354-38.000.
Nishikawa, Tatsuo; and Ozawa, Toshiaki, 4,061,219, Cl. 197-164.000.
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,062,028, Cl. 354-152.000.
Tsunekawa, Tokuichi; Uchidoi, Masanori; Shimizu, Masami; Yamamichi, Masayoshi; Murayama, Keiya; and Aizawa, Hiroshi, 4,062,024, Cl. 354-60.00R.
Cantrell, Cyrus D.; Carbone, Robert J.; and Cooper, Ralph S., to United States of America, Energy Research & Development Administration. Infrared laser system. 4,061,921, Cl. 250-423.00P.
Caprara, Giuseppe: *See*—
Fumagalli, Carlo; Caprara, Giuseppe; and Roffia, Paolo, 4,061,868, Cl. 360-246.000.
Carbone, Jorge L. Modified piano striking mechanism. 4,061,067, Cl. 84-236.000.
Carbone, Robert J.: *See*—
Cantrell, Cyrus D.; Carbone, Robert J.; and Cooper, Ralph S., 4,061,921, Cl. 250-423.00P.
Carbonnel, Henri, to Groupement pour les Activites Atomiques et Avancees "GAAA" S.A. Fluid-tight cold-chamber pressure casting apparatus. 4,061,176, Cl. 164-61.000.
Carborundum Company, The: *See*—
Cichy, Paul, 4,061,699, Cl. 264-5.000.
Cardoso, LeRoy A., to Blomberg Glass. Secondary lock for sliding door or window. 4,061,372, Cl. 292-207.000.
Carl Zeiss Stiftung: *See*—
Starp, Franz, 4,062,030, Cl. 354-286.000.
Carlsson, Carl-Eric Waldenburg; and Holmstedt, Goran Solve, to Jeppson, Nils. System for selective detection and indication of impacts upon a base surface. 4,062,008, Cl. 340-323.00R.
Carnahan, Joe B.; and Koenig, Robert B., to Recognition Equipment Incorporated. Rotational strain relief with inline plug. 4,061,380, Cl. 339-8.00R.
Carolina Steel & Wire Corporation: *See*—
Alexander, Robert W.; and Keck, John G., 4,061,553, Cl. 204-114.000.
Carroll, Glenn T. Reinforced concrete catch basin cover and lid. 4,061,434, Cl. 404-4.000.
Carstens, Bernard A., Jr.; and Carstens, Robert L., to Chicago Bullet Proof Equipment Company. Teller protection unit. 4,061,093, Cl. 109-19.000.
Carstens, Robert L.: *See*—
Carstens, Bernard A., Jr.; and Carstens, Robert L., 4,061,093, Cl. 109-19.000.
Carter, Lewis H. Roller skates. 4,061,348, Cl. 280-11.210.
Cary, John W.; and Heinemann, William H., Jr., to United States of America, Agriculture. Magnetic seed delivery autodibble planter. 4,061,094, Cl. 111-89.000.
Cascio, Giuseppe: *See*—
Manghisi, Elso; Cascio, Giuseppe; and Fregnan, Giancarlo, 4,061,637, Cl. 260-268.0PH.
Cassella Farbwerke Mainkur AG: *See*—
Fleckenstein, Erwin; Heinrich, Ernst; and Mohr, Reinhard, 4,061,642, Cl. 260-295.50A.
Castagna, Eugene Gennaro, to Dart Industries Inc. Low temperature impact strength molding compositions. 4,061,694, Cl. 260-878.00B.
Catena, Raymond. Pole inserter. 4,061,301, Cl. 248-156.000.
Caterpillar Tractor Co.: *See*—
Blomstrom, Gary D., 4,061,393, Cl. 296-28.00C.
Easter, Rollen G.; and Hooker, James A., 4,061,073, Cl. 85-62.000.
Hamsher, James J., 4,061,867, Cl. 560-219.000.
Cavalla, John Frederick; and Archibald, John Leheup, to John Wyeth & Brother Limited. 2-(Benzamido piperidine) quinolyl derivatives. 4,061,640, Cl. 260-287.0CE.
CAW Industries, Inc.: *See*—
Willard, John Wesley, 4,061,734, Cl. 424-155.000.
Cecka, Andrew M.; and Dano, Pol, to Fansteel Inc. Method of making composite high strength to weight structure. 4,061,520, Cl. 156-245.000.
Ceraver S.A.: *See*—
Willem, Michel, 4,061,515, Cl. 156-73.600.
Ceskoslovenska akademie ved: *See*—
Sedlacek, Pavel; and Hajek, Jiri, 4,061,966, Cl. 324-207.000.
Chakrabarti, Jiban Kumar; Hotten, Terrence Michael; and Tupper, David Edward, to Lilly Industries, Limited. Halogenated amino methyl adamantane derivatives. 4,061,774, Cl. 424-325.000.
Chambers, Charles W., Jr., to Lorain Products Corporation. Repeater for transmission lines of differing lengths. 4,061,883, Cl. 179-16.00F.
Chan, Rosalind Po Kuen, to Biorex Laboratories Limited. Glycyrrhetinic acid derivatives. 4,061,773, Cl. 424-313.000.
Chandler Evans Inc.: *See*—
Pech, Karl H., 4,061,439, Cl. 415-18.000.
Charles, George Kenneth, to Wincanton Engineering Limited. Method for forming blocks of natural cheese from cheese curd. 4,061,794, Cl. 426-486.000.
Chave, Henri, to Ugine Aciers. Extension rod for percussive drilling tool. 4,061,433, Cl. 403-359.000.
Chemed Corporation: *See*—
Jacob, Jose T., 4,061,589, Cl. 252-389.00A.
Chemelec Products, Inc.: *See*—
Dutton, Frederick O., III; and Stewart, Joseph H., Jr., 4,061,517, Cl. 156-212.000.
Chemische Werke Huls Aktiengesellschaft: *See*—
Kaufhold, Manfred; and Wulf, Horst-Dieter, 4,061,687, Cl. 260-632.0HF.
Sistig, Eberhard; and Reinermann, Karl-Heinz, 4,061,848, Cl. 526-61.000.
Chen, Pictiaw: *See*—
Fridley, Robert B.; Chen, Pictiaw; Mehlschau, James J.; and Claypool, Lawrence L., 4,061,020, Cl. 73-81.000.
Cheng, King Y.: *See*—
Motley, David M.; Salman, Naif D.; and Cheng, King Y., 4,061,978, Cl. 325-324.000.
Cheng, Wen-Jiu, to Dow Chemical Company, The. Viscosity reduction of cellulose derivatives. 4,061,859, Cl. 536-88.000.
Chevron Research Company: *See*—
Buss, Waldeen C., 4,061,592, Cl. 252-439.000.
Chew, William M.; Ayers, Orval E.; Murfree, James A.; and Martignoni, Pasquale, to United States of America, Army. Solid propellants for generating hydrogen. 4,061,512, Cl. 149-22.000.
Chiba Communications Industries, Inc.: *See*—
Kotezawa, Katsutaka; Onodera, Toshimi; Hayashi, Setsuo; and Shimanuki, Fujio, 4,062,016, Cl. 343-178.000.
Chicago Bullet Proof Equipment Company: *See*—
Carstens, Bernard A., Jr.; and Carstens, Robert L., 4,061,093, Cl. 109-19.000.
Chicago Pneumatic Tool Company: *See*—
Marcantonio, Livio F.; and D'Haem, Marcel P., 4,061,039, Cl. 73-489.000.
Chillier-Duchatel, Nicole; and Verger, Bernard, to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie". Electrochemical method for producing oxygen. 4,061,554, Cl. 204-129.000.
Chitis, Wolf, to Fondedile S.p.A. Process for providing a foundation pile for alternating compressive and tractive stresses and a pile thus provided. 4,060,994, Cl. 61-53.600.
Chloride Group Limited: *See*—
Foulkes, Stanley Charles, 4,061,843, Cl. 429-136.000.
Cho, Chi-Liang. Correcting device for typewriters. 4,061,220, Cl. 197-181.000.
Cholin, John M.; and Cholin, Rodger R. Fire extinguishing agent distributing device. 4,061,192, Cl. 169-16.000.
Cholin, Rodger R.: *See*—
Cholin, John M.; and Cholin, Rodger R., 4,061,192, Cl. 169-16.000.
Christian, Robert E.: *See*—
Bottom, Virgil E.; and Christian, Robert E., 4,060,888, Cl. 29-628.000.
Christopher, Nathan H. Lean charge ignition system. 4,061,114, Cl. 123-32.0SJ.
Christy, Charles A. Positive displacement vane type rotary pump. 4,061,450, Cl. 418-253.000.
Chudleigh, Walter H., Jr.: *See*—
Preston, Glenn W.; Chudleigh, Walter H., Jr.; and Ehrich, William G., 4,062,011, Cl. 343-7.00A.
Chupick, Ronald, to General Motors Corporation. Energy managing bumper system for vehicles. 4,061,386, Cl. 293-86.000.
Ciba-Geigy Corporation: *See*—
Greuter, Hans; and Bellus, Daniel, 4,061,644, Cl. 260-296.00R.
Karrer, Friedrich, 4,061,683, Cl. 260-613.00R.
Kirchmayr, Rudolf; and Illy, Hugo, 4,061,604, Cl. 260-2.5AJ.
Kormany, Geza; Kabas, Guglielmo; Schlapfer, Hans; and Siegrist, Adolf Emil, 4,061,860, Cl. 542-462.000.
Riccio, Pasquale R., 4,061,252, Cl. 222-402.180.
Rody, Jean, 4,061,631, Cl. 544-53.000.
Urech, Jakob, 4,061,853, Cl. 544-30.000.
Cichy, Paul, to Carborundum Company, The. Continuous process for producing oxide refractory material. 4,061,699, Cl. 264-5.000.

Cincinnati Milacron, Inc.: *See*—
White, William Page; and Hawkins, Kenneth Robert, 4,060,942, Cl. 51-268.000.

Citizen Watch Company Limited: *See*—
Natori, Minoru; Hatuse, Toshikazu; Kawanobe, Kouhei; Ogawa, Hiroshi; Sekiya, Fukuo; Ebihara, Heihachiro; and Uchino, Misao, 4,060,974, Cl. 58-23.00R.
Yamaguchi, Sizuo, 4,060,975, Cl. 58-50.00R.

Claeson, Karl Goran: *See*—
Af Ekenstam, Bo Thuresson; Aurell, Leif Eric; Claeson, Karl Goran; and Karlsson, Birgitta Gunilla, 4,061,625, Cl. 260-112.50R.

Clancy, John F.; and Welter, Clarence L. Modular vault-type load break switch. 4,061,896, Cl. 200-323.000.

Clark, Anthony W.; and Stubbs, Rex G., Jr., to Beckett Corporation. System and method for maintaining a liquid level. 4,061,442, Cl. 417-36.000.

Clark, George B., to Dow Chemical Company, The. Assembly of permeable hollow fibers and a tubesheet supportable at its face and opened by bores parallel thereto. 4,061,574, Cl. 210-321.00R.

Clarke, John L., Jr., to Clarke Outdoor Spraying Co., Inc. Mosquito larvae dipper. 4,061,038, Cl. 73-427.000.

Clarke Outdoor Spraying Co., Inc.: *See*—
Clarke, John L., Jr., 4,061,038, Cl. 73-427.000.

Clary, Jerome Francis; Wiley, Robert Emerson; and Bowns, Richard Earl, to Acheson Industries, Inc. Electrically conductive rear view mirror. 4,061,601, Cl. 252-511.000.

Claypool, Lawrence L.: *See*—
Fridley, Robert B.; Chen, Pictiaw; Mehlschau, James J.; and Claypool, Lawrence L., 4,061,020, Cl. 73-81.000.

Cline, William E.: *See*—
King, James L., Sr.; King, James L., Jr.; and Cline, William E., 4,061,286, Cl. 242-56.00R.

Coats Company, Inc., The: *See*—
Daly, Robert V., 4,061,173, Cl. 157-1.170.

Cogan, Fredrick Thomas: *See*—
Gumb, Beverley William; Kuhfus, Gerd; and Cogan, Fredrick Thomas, 4,061,411, Cl. 339-159.00R.

Cohen, Lester Samuel; and Lewis, William Dein, to Du Pont de Nemours, E. I., and Company. Oil filter. 4,061,572, Cl. 210-168.000.

Coherent Radiation: *See*—
Barker, Gerald C., 4,061,986, Cl. 331-94.5PE.

Colbert, Richard P.; Dimitriou, George; Jones, Max E.; and Haberman, Jack I., to United States of America, Navy. Digital radar signal processor. 4,062,012, Cl. 343-7.00A.

Cole, Keith M., Jr., to General Foods Corporation. Continuous double coating-natural cereal. 4,061,790, Cl. 426-303.000.

Coleman, John R.; and McDaniel, Dwight W., to General Motors Corporation. Cup seal for use in a master cylinder. 4,061,346, Cl. 277-205.000.

Colgate-Palmolive Company: *See*—
Klisch, Stephen Cajetan; and Martin, Charles Andrew, 4,061,586, Cl. 252-153.000.
Rockefeller, Winston C., 4,061,253, Cl. 222-442.000.
Rubinfeld, Joseph, 4,061,603, Cl. 252-548.000.

Collins, David N.: *See*—
Collins, Eugene C.; Collins, Stephen E.; and Collins, David N., 4,060,909, Cl. 33-296.000.

Collins, Eugene C.; Collins, Stephen E.; and Collins, David N. Surveying rod. 4,060,909, Cl. 33-296.000.

Collins, Galen R.; May, George A.; and Gendo, Indra Lee, to Dicom Systems, Ltd. Time-multiplex programmable switching apparatus. 4,061,880, Cl. 179-15.0BA.

Collins, Stephen E.: *See*—
Collins, Eugene C.; Collins, Stephen E.; and Collins, David N., 4,060,909, Cl. 33-296.000.

Color Communications, Inc.: *See*—
Lerner, Stanley; and Shearer, Robert, 4,061,521, Cl. 156-265.000.

Colorflo Limited: *See*—
Farrow, Harold F., 4,061,085, Cl. 101-150.000.

Columbia Chemical Corporation: *See*—
Rosenberg, William E., 4,061,547, Cl. 204-54.00R.

Columbia Steel Casting Co. Inc.: *See*—
McBain, Robert T.; and Johnson, Bruce C., 4,060,978, Cl. 59-78.000.

Commissariat a l'Energie Atomique: *See*—
Pigeon, Michel, 4,061,968, Cl. 324-40.000.

Compagnie Generale des Etablissements Michelin: *See*—
Boileau, Jacques; and Mathevet, Albert, 4,061,171, Cl. 152-352.00R.

Compagnie Industrielle Radioelectrique: *See*—
Durrer, Franz, 4,061,436, Cl. 408-3.000.

Computer Peripherals, Inc.: *See*—
Sachuk, Daniel B.; and Lane, Robert L., 4,061,329, Cl. 271-10.000.

Concraig Holdings Limited: *See*—
Craig, Ashley Graham, 4,060,863, Cl. 5-337.000.

Conrow, Ransom Brown; Bernstein, Seymour; and Bauman, Norman, to American Cyanamid Company. Bis-substituted naphthalene-azo phenyleneazo-stilbene-disulfonic and naphthalene-sulfonic acid. 4,061,627, Cl. 260-178.000.

Consolidated Video Systems, Inc.: *See*—
Tallent, Michael W.; Scaggs, Lee E.; Swain, Allan L.; Harrison, Ronnie M.; and Hendershot, William B., III, 4,062,041, Cl. 358-8.000.

Continental Group, Inc., The: *See*—
Khoury, Nick S., 4,061,243, Cl. 220-269.000.

Contraves AG: *See*—
Schattmaier, Kurt, 4,061,304, Cl. 248-404.000.

Control Data Corporation: *See*—
Preston, Glenn W.; Chudleigh, Walter H., Jr.; and Ehrich, William G., 4,062,011, Cl. 343-7.00A.

Conway, Malcolm J. Mental image enhancement apparatus utilizing computer systems. 4,060,915, Cl. 35-9.00A.

Cook, Edward H., Jr.; and Emery, Alvin T., to Hooker Chemicals & Plastics Corporation. Process for electrolysis. 4,061,550, Cl. 204-98.000.

Cook Electric Company: *See*—
Cwirzen, Casimir, 4,062,053, Cl. 361-119.000.

Cook, Gregory Edward. Outrigger sailboat. 4,061,099, Cl. 114-39.000.

Cook, Gregory Edward. Sail furling apparatus. 4,061,101, Cl. 114-106.000.

Cooper, James T. Fruit clipper. 4,060,962, Cl. 56-336.000.

Cooper, Ralph S.: *See*—
Cantrell, Cyrus D.; Carbone, Robert J.; and Cooper, Ralph S., 4,061,921, Cl. 250-423.00P.

Copas, Gordon A.: *See*—
Fiedler, Edgar F.; Copas, Gordon A.; and Willey, Arthur F., 4,060,959, Cl. 53-373.000.

Copp, Robert M. Bag making machine. 4,061,260, Cl. 226-139.000.

Corbett, Jack William: *See*—
Goss, John B.; Morrow, William D.; and Corbett, Jack William, 4,061,230, Cl. 212-70.000.

Cordell, Carl R., Jr. Fishing lure with weighted hook-attaching swivel and method of making same. 4,060,926, Cl. 43-42.440.

Cordell, Robert Roger, to Bell Telephone Laboratories, Incorporated. Window comparator. 4,061,932, Cl. 307-360.000.

Corey, Donald Wyman: *See*—
Friedman, Harvey William; and Corey, Donald Wyman, 4,060,854, Cl. 2-338.000.

Cornell Research Foundation, Inc.: *See*—
Finn, Robert K.; Tannahill, Alex L.; and Laptewicz, Joseph E., Jr., 4,061,585, Cl. 252-89.00R.
Zall, Robert R.; Sobel, A. Theodore; and Price, Donald R., 4,061,504, Cl. 134-95.000.

Corporation for Public Broadcasting: *See*—
Hetrich, Wayne L., 4,061,042, Cl. 73-647.000.

Cosden Technology, Inc.: *See*—
Watson, James M., 4,061,545, Cl. 203-9.000.

Costales, Manuel; and Hakki, Moustafa I. Flyer for twisting mechanisms. 4,060,969, Cl. 57-102.000.

Costello, Francis E. Plating process and bath. 4,061,802, Cl. 427-304.000.

Coster, Theo Maurice Simon, to Or Da Industries Ltd. Movable puzzle. 4,061,339, Cl. 273-157.00R.

Couchoud, Paul, to Rhone-Poulenc-Textile. Shaped polyester articles having good flame resistance and process for the production thereof. 4,061,615, Cl. 260-45.70P.

Coulon, Andre; and Perrin, Rene, to Societe General de Constructions Electriques et Macaniques Alsthom. Compound turbine rotor and method for manufacturing elements constituting such a rotor. 4,060,883, Cl. 29-156.80R.

Counsell, Patrick James Claude; and Whitehouse, Sydney Robert, to Evode Holdings Limited. Water activatable tapes. 4,061,825, Cl. 428-355.000.

Couton, Lucien. Water flushing device. 4,060,857, Cl. 4-26.000.

Cox, James L.; and Pippin, Jack M. Umbrella with interchangeable tops. 4,061,154, Cl. 135-34.000.

Cragoe, Edward J., Jr.; and Bicking, John B., to Merck & Co., Inc. Certain 16-aryloxy-11,12-seco-prostaglandins. 4,061,643, Cl. 260-295.00R.

Craig, Ashley Graham, to Concraig Holdings Limited. Cushions or pillows. 4,060,863, Cl. 5-337.000.

Cranfield Institute of Technology: *See*—
Dinsdale, Jack; McQue, David Wallace; and Vorley, Geoffrey, 4,061,952, Cl. 318-572.000.

Creagan, Robert J.; and Frisch, Erling, to United States of America, Energy Research and Development Administration. Fuel assembly for nuclear reactors. 4,061,536, Cl. 176-78.000.

Credner, Hans-Heinrich: *See*—
Monbaliu, Marcel Jacob; Mannens, Marc Godfried; Van Poucke, Raphael Karel; Credner, Hans-Heinrich; and Meier, Ernst, 4,061,498, Cl. 96-100.00R.

Crest Industries, Inc.: *See*—
Rasmussen, Harry R., 4,061,888, Cl. 179-100.00D.

Criswell, Robert Lenox: *See*—
Guido, Paul Vincent; Criswell, Robert Lenox; and Zipay, Albert John, 4,060,990, Cl. 60-676.000.

Cross Up, Inc.: *See*—
Blum, John Tudor, 4,061,354, Cl. 280-288.000.

Crouch, Donald Wayne, to General Electric Company. Vacuum-type circuit interrupter with improved protection for bellows. 4,061,894, Cl. 200-144.00B.

Crovetti, Aldo Joseph; and Stein, Robert George, to Abbott Laboratories. Certain O-substituted thiophene oxime carbamates used as antibacterial and antifungal agents. 4,061,764, Cl. 424-275.000.

Crowell, Donald Edward: *See*—
Duffield, Peter Roe; Flockton, Peter Robin; Lillis, Rupert Martin; Turner, Brian Maurice; and Crowell, Donald Edward, 4,061,706, Cl. 264-90.000.

Cummins Engine Company, Inc.: *See*—
Rajasekaran, Ramanujam; Taylor, Dennis O.; and Whittlesey, James W., 4,061,187, Cl. 165-107.000.
Cunningham, Douglas James, to Wingard Limited. Variable torque drive. 4,061,291, Cl. 242-107.000.
Cunningham, Leroy G. Fishing pole eye. 4,060,924, Cl. 43-24.000.
Cunningham, William L.; and Graham, Duane W., to Hyster Company. Load carrying fork for an industrial vehicle. 4,061,238, Cl. 214-750.000.
Cuomo, Jerome John; DiStefano, Thomas Herman; and Rosenberg, Robert, to International Business Machines Corporation. Radiation responsive device. 4,062,038, Cl. 357-30.000.
Cutler-Hammer, Inc.: *See*—
Hults, Harold W., 4,061,895, Cl. 200-157.000.
Cwirzen, Casimir, to Cook Electric Company. Protector module. 4,062,053, Cl. 361-119.000.
Daaboul, Fouad: *See*—
Adoul, Jean-Pierre; and Daaboul, Fouad, 4,061,878, Cl. 179-1.0SC.
Dacons, Joseph C.; and Sitzmann, Michael E., to United States of America, Navy. 2,5-Dipicrylfurans. 4,061,658, Cl. 260-346.110.
Dahl, Klaus-Peter, to Didier Engineering GmbH. Door locking mechanism for coke oven door. 4,061,382, Cl. 292-260.000.
Daiichi Koshuha Kogyo Kabushiki Kaisha: *See*—
Kawanami, Shunpei; and Hanamoto, Yukimitsu, 4,061,005, Cl. 72-30.000.
Daimler-Benz Aktiengesellschaft: *See*—
Kohler, Werner, 4,061,839, Cl. 429-93.000.
Daly, Robert V., to Coats Company, Inc., The. Tire servicing apparatus. 4,061,173, Cl. 157-1.170.
Dancy, Edna A.: *See*—
Fey, Maurice G.; and Dancy, Edna A., 4,061,492, Cl. 75-10.00R.
D'Angelo, Robert A., to Keystone Products, Inc. Spoke wheel anti-theft clip. 4,061,400, Cl. 301-37.0AT.
Danielson, Carl G. Wrapping apparatus for pipeline joints. 4,061,513, Cl. 156-392.000.
Dano, Pol: *See*—
Cecka, Andrew M.; and Dano, Pol, 4,061,520, Cl. 156-245.000.
Dany, Franz-Josef: *See*—
Vollmer, Hartfrid; Dany, Franz-Josef; and Wortmann, Joachim, 4,061,696, Cl. 260-930.000.
Dart Industries Inc.: *See*—
Castagna, Eugene Gennaro, 4,061,694, Cl. 260-878.00B.
Dasher, George F.; O'Cull, Kathleen A.; and Schamper, Thomas J., to Alberto-Culver Company. Quaternary ammonium compounds in pretreatment of hair before shampooing with an anionic shampoo. 4,061,150, Cl. 132-7.000.
Daswick, Alexander C. Method for brewing a beverage. 4,061,793, Cl. 426-433.000.
Data General Corporation: *See*—
Masciarelli, Francis John, 4,061,900, Cl. 235-437.000.
Datta, Pabitra: *See*—
Goldman, Abraham; and Datta, Pabitra, 4,061,529, Cl. 156-644.000.
Davies, David R.: *See*—
Meijs, Franciscus H.; and Davies, David R., 4,061,191, Cl. 166-292.000.
Davies, Michael Bowen: *See*—
Pratt, Norman Leslie; and Davies, Michael Bowen, 4,062,046, Cl. 358-93.000.
Davies, Thomas R. Drip controlling spout. 4,061,255, Cl. 222-566.000.
Davis, Charles A.: *See*—
Benda, David; and Davis, Charles A., 4,061,945, Cl. 313-481.000.
Davis, Leonard C., to General Motors Corporation. Regenerator matrix. 4,061,183, Cl. 165-8.000.
Davis, Pauls: *See*—
Helfert, Herbert; Langdon, William Keith; and Davis, Pauls, 4,061,684, Cl. 260-615.00B.
Davis, William Clair: *See*—
Raisbeck, Wesley Paul; Bass, Merlyn Duane; Whicker, Bobbie Dean; Davis, William Clair; and Fairbank, Raymond Harry, 4,061,284, Cl. 241-294.000.
Davy, David Larry, to B. F. Goodrich Company, The. Brake disc adapter for use with anti-skid system. 4,061,213, Cl. 188-181.00R.
Davydov, Sergei Lvovich: *See*—
Blyakhman, Lazar Isaevich; Davydov, Sergei Lvovich; and Kashina, Valentina Fedorovna, 4,061,633, Cl. 544-106.000.
Dayco Corporation: *See*—
Duckett, John C.; Easley, Wayne W.; and Gaworowski, Andrew J., 4,061,818, Cl. 428-246.000.
Schmidt, Ernest J., Jr.; Rinehart, Michael G.; and Blevins, Bascom D., 4,061,350, Cl. 280-87.04A.
DDSA Pharmaceuticals Ltd.: *See*—
Shenoy, Umakant Devdas, 4,061,745, Cl. 424-244.000.
Dean, Anthony James, to International Computers Limited. Apparatus for testing printed circuit boards. 4,061,969, Cl. 324-73.0PC.
Dechelette, Helen; and Joly, Jean Claud, to AMP Incorporated. Method of manufacturing an electrical harness. 4,060,890, Cl. 29-628.000.
Decker, John J.; and Ricards, Charles R., to GTE Sylvania Incorporated. Method of filling electrochemical cells with electrolyte. 4,061,163, Cl. 141-7.000.
Deere & Company: *See*—
Dunn, James Knox, III; Tucker, Lee Everett; and Redman, Andrew Paul, 4,061,167, Cl. 144-34.00E.
Hengen, Edward John; and Love, Mahlon Lloyd, 4,060,960, Cl. 56-14.600.
Hilgert, Charles William; and Lobmeyer, Raymond Joseph, 4,061,576, Cl. 210-437.000.
Newhouse, Thomas Charles, 4,061,047, Cl. 74-230.17C.
Raisbeck, Wesley Paul; Bass, Merlyn Duane; Whicker, Bobbie Dean; Davis, William Clair; and Fairbank, Raymond Harry, 4,061,284, Cl. 241-294.000.
Deffeyes, Robert J.; and Tyler, Wesley R., to Graham Magnetics Incorporated. Novel metal powders and magnetic tapes produced therewith. 4,061,824, Cl. 428-328.000.
De Groef, Pierre, to N. V. Raychem S.A. Multiple conductor connector and method of connecting conductors to terminals therewith. 4,060,887, Cl. 29-626.000.
de Jonge, Jan Hendrik; and Smulders, Adrianus Josephus, to U.S. Philips Corporation. Method of and device for testing a digital memory. 4,061,908, Cl. 235-302.300.
Delalande S.A.: *See*—
Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy R.; and Gouret, Claude J., 4,061,855, Cl. 544-122.000.
del Castillo, Juan M. Device to identify chords on a keyboard instrument and key mechanism for use therewith. 4,061,072, Cl. 84-478.000.
Delta Plastics Limited: *See*—
Reggers, Charles Gerardus, 4,060,922, Cl. 40-302.000.
Demas, Nickolas P.: *See*—
Fitzgerald, James J.; Fortunato, Joseph J.; and Demas, Nickolas P., 4,061,940, Cl. 313-318.000.
DeMaster, Robert D., to Minnesota Mining and Manufacturing Company. Traction mat. 4,061,268, Cl. 238-14.000.
Demilie, Paul: *See*—
Verlaeten, Jean; and Demilie, Paul, 4,061,718, Cl. 423-356.000.
Demny, Thomas Casimir; and Maehr, Hubert, to Hoffmann-La Roche Inc. 2-Methyl-L-arginine produced by cultivating streptomyces strain. 4,061,542, Cl. 195-80.00R.
DeMonsy, Richard L.; and Hankins, Norman K., to Hexcel Corporation. Cable splice kit. 4,061,872, Cl. 174-138.00F.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. 3,11-Dihydro-6H-pyrazolo[1,5-a]pyrazolo[4',3':5,6]-pyrido[4,3-d]pyrimidin-6-one derivatives. 4,061,632, Cl. 544-60.000.
DeSantis, Raymond P., to Wolverine Aluminum Corporation. Apparatus for producing spherical articles. 4,061,452, Cl. 425-78.000.
DeSantis, Raymond P., to Wolverine Aluminum Corporation. Tooling for a powder compacting press. 4,061,453, Cl. 425-78.000.
De Schepper, Achille; and Van Peteghem, Antoine, to Metallurgie Hoboken-Overpelt. Treatment of solutions containing impure metals. 4,061,564, Cl. 210-21.000.
DesMarais, Thomas A., to Procter & Gamble Company, The. Absorbent foam articles and method of manufacture. 4,061,145, Cl. 128-275.000.
Desmarquest & C. E.C.: *See*—
Bardet, Gerard, 4,061,451, Cl. 425-66.000.
De Soto, Diogenes. Wallet supporting clip. 4,060,876, Cl. 24-3.00J.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Asinger, Friedrich; Pfeifer, Wolf-Dieter; Offermanns, Heribert; Scherberich, Paul; and Schreyer, Gerd, 4,061,674, Cl. 260-534.00S.
Schwarze, Werner; Merk, Wolfgang; and Binder, Volker, 4,061,869, Cl. 526-1.000.
Development Finance Corporation: *See*—
Nixon, Peter Anthony, 4,061,033, Cl. 73-339.00R.
DeWitt, Carol Lynn Hartsock, administratrix: *See*—
DeWitt, Erik John, deceased, 4,060,940, Cl. 51-170.0PT.
DeWitt, Erik John, deceased (by DeWitt, Carol Lynn Hartsock, administratrix), to Black and Decker Manufacturing Company, The. Adjustable guard construction for cut-off machine. 4,060,940, Cl. 51-170.0PT.
Dextec Metallurgical Proprietary Limited: *See*—
Everett, Peter Kenneth, 4,061,552, Cl. 204-107.000.
Deyres, Andre: *See*—
Barbe, Gerard; and Deyres, Andre, 4,060,968, Cl. 57-140.0BY.
D'Haem, Marcel P.: *See*—
Marcantonio, Livio F.; and D'Haem, Marcel P., 4,061,039, Cl. 73-489.000.
Diamond, Julius; and Douglas, George H., to William H. Rorer, Inc. Ethynylindenyl compounds and derivatives thereof used in the treatment of pain, fever and inflammation. 4,061,771, Cl. 424-304.000.
Diamond Shamrock Corporation: *See*—
Marks, Alfred F., 4,061,770, Cl. 424-304.000.
Dicom Systems, Ltd.: *See*—
Collins, Galen R.; May, George A.; and Gendo, Indra Lee, 4,061,880, Cl. 179-15.0BA.
Dictaphone Corporation: *See*—
Whitney, James C., 4,061,292, Cl. 242-201.000.
Didier Engineering GmbH: *See*—
Dahl, Klaus-Peter, 4,061,382, Cl. 292-260.000.
DiDominico, Mario A.; and Smithgall, Harry E., to GTE Sylvania Incorporated. Cathode ray tube with supported conductor extending through exhaust tubulation. 4,061,943, Cl. 313-482.000.
Dieck, Ronald Lee; and Quinn, Edwin John, to Armstrong Cork Company. Polyphosphazene polymer/organic polymer foams. 4,061,606, Cl. 260-2.50R.
Diez, Adolf, to Karl Schmidt GmbH. Low-pressure casting apparatus. 4,061,182, Cl. 164-309.000.
Dighe, Shrikant Vishwanath: *See*—
Guthrie, James Leverette; and Dighe, Shrikant Vishwanath, 4,061,864, Cl. 560-26.000.

Digital Communications Corporation: *See*—
Walker, Andrew M.; and Gabbard, Ova Gene, 4,061,979, Cl. 325-419.000.

Dimitriou, George: *See*—
Colbert, Richard P.; Dimitriou, George; Jones, Max E.; and Haberman, Jack I., 4,062,012, Cl. 343-7.00A.

Dinsdale, Jack; McQue, David Wallace; and Vorley, Geoffrey, to Cranfield Institute of Technology. Computer-controlled machine tool. 4,061,952, Cl. 318-572.000.

Dirk, William R.; and Parker, Sidney A., to Lennox Industries, Inc. Compressor muffling arrangement. 4,061,444, Cl. 417-312.000.

Dirks, Wolfgang Gerhard, to Burroughs Corporation. Integrated Disk File Module and memory storage system. 4,062,049, Cl. 360-78.000.

DiStefano, Thomas Herman: *See*—
Cuomo, Jerome John; DiStefano, Thomas Herman; and Rosenberg, Robert, 4,062,038, Cl. 357-30.000.

Dockerty, Robert Charles: *See*—
Abbas, Shakir Ahmed; and Dockerty, Robert Charles, 4,062,040, Cl. 357-54.000.

Dr. Johannes Heidenhain GmbH: *See*—
Ernst, Alfons, 4,060,903, Cl. 33-125.00R.

Dr. Madaus & Co.: *See*—
Madaus, Rolf Hermann Heinrich; Halbach, Gunter; and Trost, Wilfried, 4,061,765, Cl. 424-278.000.

Doherty, Thomas E. Paint roller cleaning apparatus. 4,061,153, Cl. 134-138.000.

Dolfini, Joseph E.; Bohme, Ekkehard; and Slusarchyk, William A., to E. R. Squibb & Sons, Inc. 6-Amino-6-arylthio penicillanic acids and derivatives thereof. 4,061,629, Cl. 260-239.100.

Dolfini, Joseph Edward; and Bohme, Ekkehard, to E. R. Squibb & Sons, Inc. 7-Amino-7-arylthio cephalosporins. 4,061,851, Cl. 544-21.000.

Dolfini, Joseph Edward, to E. R. Squibb & Sons, Inc. 7-Methoxy furylureidocephalosporins. 4,061,852, Cl. 544-27.000.

Donlon, Joseph J. Dripless paint container. 4,061,242, Cl. 220-90.000.

Donnelly, Robert Murray, to Mostek Corporation. Current sense amp for static memory cell. 4,062,000, Cl. 365-203.000.

Dorn, Conrad P.: *See*—
Shen, Tsung-Ying; Jones, Howard; and Dorn, Conrad P., 4,061,759, Cl. 424-263.000.

Dorn, Friedrich Wilhelm: *See*—
Schallus, Erich; Mietens, Gerhard; Fucker, Gregor; Petrell, Jurgen; and Dorn, Friedrich Wilhelm, 4,061,719, Cl. 423-445.000.

Dorner, Friedrich; Scriba, Marianne; and Weil, Rudolf, to Sandoz Ltd. Enzymatically oxidizing interferon. 4,061,538, Cl. 195-29.000.

Dorren, Louis, to Quadracast Systems, Inc. Quadrature multiplying four-channel demodulator. 4,061,882, Cl. 179-15.0BT.

Doshi, Niranjan Kumar, to Apostol, Frank. Power-converting device. 4,061,445, Cl. 418-54.000.

Dotsenko, Anna Evgenievna: *See*—
Ivanova, Raisa Vasilievna; Belsky, Arkady Andreevich; Novikov, Nikolai Alexandrovich; Alexeeva, Nina Nikolaevna; Nikitina, Ljudmila Nikolaevna; Ljubimova, Nina Andreevna; and Dotsenko, Anna Evgenievna, 4,061,551, Cl. 204-105.00R.

Dougan, Patrick Daniel: *See*—
Stock, Thomas Adrian Cheetham; Dougan, Patrick Daniel; and Sivilotti, Olivo Guiseppe, 4,061,010, Cl. 72-201.000.

Douglas, George H.: *See*—
Diamond, Julius; and Douglas, George H., 4,061,771, Cl. 424-304.000.

Douglas, Thomas P. Locking hub tool. 4,061,058, Cl. 81-90.00C.

Dow Chemical Company, The: *See*—
Cheng, Wen-Jiu, 4,061,859, Cl. 536-88.000.
Clark, George B., 4,061,574, Cl. 210-321.00R.
Dubois, Robert A.; and Freedman, Harold H., 4,061,682, Cl. 260-611.00A.
Goralski, Christian T., 4,061,639, Cl. 260-283.00S.
Gross, James R.; and McFadden, Russell T., 4,061,846, Cl. 526-16.000.
Hazelrigg, Mark Jonathan, Jr.; and Caldwell, Donald Lee, 4,061,549, Cl. 204-98.000.
Pelletier, Ronald R.; Hansen, Robert D.; and Vanderbush, James J., 4,061,833, Cl. 428-511.000.

Dow Corning Corporation: *See*—
Miller, Carl W.; Vandenberg, Lester C.; and Statt, Wayne H., 4,061,709, Cl. 264-293.000.

Drews, Reinhold Alvin, to Whirlpool Corporation. Motor shield for appliance. 4,061,002, Cl. 68-212.000.

Du Pont of Canada Limited: *See*—
Duffield, Peter Roe; Flockton, Peter Robin; Lillis, Rupert Martin; Turner, Brian Maurice; and Crowell, Donald Edward, 4,061,706, Cl. 264-90.000.

Dubied, Gilbert; and Kuenzi, Ernst, to Laboratoire Suisse de Recherches Horlogeres. Device of plane-parallel treatment of surfaces. 4,060,939, Cl. 51-157.000.

Dubois, Robert A.; and Freedman, Harold H., to Dow Chemical Company, The. Preparation of symmetrical ethers. 4,061,682, Cl. 260-611.00A.

DuBose, Charles Ray, to Hycel, Inc. Calibration in a blood analyzer. 4,061,469, Cl. 23-253.00R.

Ducharme, Gerald Louis: *See*—
Hannie, David Eugene; and Ducharme, Gerald Louis, 4,061,496, Cl. 96-29.00D.

Duckett, John C.; Easley, Wayne W.; and Gaworowski, Andrew J., to Dayco Corporation. Printing blanket containing high strength filaments. 4,061,818, Cl. 428-246.000.

Duffield, Peter Roe; Flockton, Peter Robin; Lillis, Rupert Martin; Turner, Brian Maurice; and Crowell, Donald Edward, to Du Pont of Canada Limited. Process for the continuous melt thermoforming of polymers. 4,061,706, Cl. 264-90.000.

Dunn, Donnell Lynn, to J. I. Case Company. Hydraulic system with dual pumps for tractor brake, steering, and loader valves. 4,061,201, Cl. 180-133.000.

Dunn, James Knox, III; Tucker, Lee Everett; and Redman, Andrew Paul, to Deere & Company. Single piece tree shear blade having cylindrically curved cutting portion and method of making same. 4,061,167, Cl. 144-34.00E.

Du Pont de Nemours, E. I., and Company: *See*—
Cohen, Lester Samuel; and Lewis, William Dein, 4,061,572, Cl. 210-168.000.
Makar, Kamel Michel, 4,061,598, Cl. 252-466.0PT.
Moore, Earl P., Jr., 4,061,590, Cl. 252-426.000.
Weigert, Frank Julian, 4,061,685, Cl. 260-621.00G.

Duranleau, Roger G.: *See*—
Love, Richard F.; and Duranleau, Roger G., 4,061,651, Cl. 260-307.00H.

Durrant, Oliver W., to Babcock & Wilcox Company, The. Control system for a nuclear power producing unit. 4,061,533, Cl. 176-20.00R.

Durrer, Franz, to Compagnie Industrielle Radioelectrique. Banknote invalidating machine. 4,061,436, Cl. 408-3.000.

Dutton, Frederick O., III; and Stewart, Joseph H., Jr., to Chemelec Products, Inc. Method of making fluorocarbon resin covered gaskets. 4,061,517, Cl. 156-212.000.

Dybas, Richard A.; Grier, Nathaniel; and Witzel, Bruce E., to Merck & Co., Inc. Polyamine compounds as antibacterial agents. 4,061,775, Cl. 424-330.000.

Dybel, Frank R.: *See*—
Dybel, William P.; and Dybel, Frank R., 4,062,055, Cl. 361-160.000.

Dybel, William P.; and Dybel, Frank R. Load monitoring system with high and low load control. 4,062,055, Cl. 361-160.000.

Dyki, Joseph J., to Firestone Tire & Rubber Company, The. Buckle switch. 4,060,878, Cl. 24-230.00A.

Dysart, Charles E. Mounting structure for a vehicle accessory such as a CB radio or the like. 4,061,258, Cl. 224-42.42R.

E.L.A.P.: *See*—
Magneron, Jean, 4,061,970, Cl. 325-2.000.

E. Mollers, Firma: *See*—
Birkenfeld, Richard; and Jaschke, Reinhold, 4,060,957, Cl. 53-26.000.

E. R. Squibb & Sons, Inc.: *See*—
Denzel, Theodor; and Hoehn, Hans, 4,061,632, Cl. 544-60.000.
Dolfini, Joseph E.; Bohme, Ekkehard; and Slusarchyk, William A., 4,061,629, Cl. 260-239.100.
Dolfini, Joseph Edward; and Bohme, Ekkehard, 4,061,851, Cl. 544-21.000.
Dolfini, Joseph Edward, 4,061,852, Cl. 544-27.000.
Sprague, Peter W., 4,061,655, Cl. 260-315.000.

Eagle-Picher Industries, Inc.: *See*—
Lowder, James E.; and Perry, Gary D., 4,061,392, Cl. 296-28.00C.

Easley, Wayne W.: *See*—
Duckett, John C.; Easley, Wayne W.; and Gaworowski, Andrew J., 4,061,818, Cl. 428-246.000.

Easter, Rollen G.; and Hooker, James A., to Caterpillar Tractor Co. Controllably deformable fastener assembly. 4,061,073, Cl. 85-62.000.

Eastman Kodak Company: *See*—
Hannie, David Eugene; and Ducharme, Gerald Louis, 4,061,496, Cl. 96-29.00D.
Jones, Glenn C.; and Meen, Ronald H., 4,061,548, Cl. 204-78.000.
Rushing, Allen J., 4,061,222, Cl. 198-807.000.
Wilkes, Glenn R.; and Brault, Albert T., 4,061,497, Cl. 96-77.000.

Eaton Corporation: *See*—
Keene, Derek K.; and Hinde, Walter R., 4,061,053, Cl. 74-512.000.
Tinholt, Thomas H., 4,061,218, Cl. 192-58.00B.

Eaves, Ronald Spencer, to Ernest Scragg & Sons Limited. Yarn texturing machine. 4,060,964, Cl. 57-34.0HS.

Ebauches S.A.: *See*—
Rochat, Daniel, 4,060,977, Cl. 58-85.500.

EBCO Manufacturing Company: *See*—
Radcliffe, Richard J., 4,061,184, Cl. 165-38.000.

Eberle, Jeannine A.: *See*—
Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy R.; and Gouret, Claude J., 4,061,855, Cl. 544-122.000.

Ebihara, Heihachiro: *See*—
Natori, Minoru; Hatuse, Toshikazu; Kawanobe, Kouhei; Ogawa, Hiroshi; Sekiya, Fukuo; Ebihara, Heihachiro; and Uchino, Misao, 4,060,974, Cl. 58-23.00R.

Echte, Adolf: *See*—
Wild, Hans; Jung, Rudolf; Echte, Adolf; Zizlsperger, Johann; and Gausepohl, Hermann, 4,061,858, Cl. 526-67.000.

Eda, Yasuko: *See*—
Yamada, Hirotada; Okamura, Kosaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,061,748, Cl. 424-246.000.

Edgar, Miriam E.: *See*—
Edgar, Robert G.; and Edgar, Miriam E., 4,061,122, Cl. 123-169.00R.

Edgar, Robert G.; and Edgar, Miriam E. Spark plug. 4,061,122, Cl. 123-169.00R.

Edmondson, Morris S., to Petro-Tex Chemical Corporation. Emulsion polymerization of chloroprene in the presence of a polysulfide modifier. 4,061,850, Cl. 526-220.000.

Edson Tool & Manufacturing Company, Inc.: *See—*
Prather, Joseph E.; and Khalifa, Ramzi A., 4,061,371, Cl. 292-198.000.
Edwards, Bryan William, to Foseco International Limited. Fixing of shaped bodies to metal casting moulds. 4,061,174, Cl. 164-6.000.
Edwards, Lindell N. Signboard. 4,060,920, Cl. 40-140.000.
Edwards, Nigel, to National Research Development Corporation. Surgical use of a laryngeal prosthesis. 4,060,856, Cl. 3-1.300.
Ehinger, Adolf. Arrangement for comminuting and/or shredding of paper and synthetic materials. 4,061,278, Cl. 241-74.000.
Ehlers, Bernd: *See—*
Rothgordt, Ulf; Ehlers, Bernd; Bunge, Ernst; and Piotrowski, Herbert, 4,062,014, Cl. 340-347.0DD.
Ehrich, William G.: *See—*
Preston, Glenn W.; Chudleigh, Walter H., Jr.; and Ehrich, William G., 4,062,011, Cl. 343-7.00A.
Eisai Co., Ltd.: *See—*
Kijima, Shizumasa; Yamatsu, Isao; Minami, Norio; and Inai, Yuichi, 4,061,660, Cl. 260-396.00R.
Eitzen, Vincent Elliott; and Moore, Robert Rockwell, to American Hospital Supply Corporation. Orbital platform stirring system. 4,061,315, Cl. 366-111.000.
Ekman, Bo Magnus: *See—*
Sjoholm, Ingvar Gosta Holger; Lindmark, Nils Roger; and Ekman, Bo Magnus, 4,061,466, Cl. 23-230.00B.
Electricity Council, The: *See—*
Jones, Ivor Wynn; Robinson, Graham; and Bird, Thomas Lewis, 4,061,840, Cl. 429-104.000.
Electro-Therm, Inc.: *See—*
Skinner, Charles A., 4,061,412, Cl. 339-263.00R.
Electrohome Limited: *See—*
Ott, Arthur Richard, 4,062,042, Cl. 358-27.000.
Electronic Associates, Inc.: *See—*
Hannauer, George; and Asthana, Abhaya, 4,061,904, Cl. 364-608.000.
Eli Lilly and Company: *See—*
Herron, David K., 4,061,630, Cl. 544-16.000.
Lunn, William H. W., 4,061,861, Cl. 544-30.000.
McDougald, Larry R., 4,061,755, Cl. 424-263.000.
Shields, James E., 4,061,607, Cl. 260-8.000.
Shields, James E., 4,061,626, Cl. 260-112.50S.
Ellendt, Gunther: *See—*
Knofel, Hartmut; and Ellendt, Gunther, 4,061,678, Cl. 260-570.00D.
Elsaesser, Fred L.; and Hall, Joseph H., to United Technologies Corporation. Stall warning detector for gas turbine engine. 4,060,979, Cl. 60-39.030.
Elsaesser, Fred L.; and Hall, Joseph H., to United Technologies Corporation. Stall detector for a gas turbine engine. 4,060,980, Cl. 60-39.030.
Elsas, Norman E., to Louisville Bedding Company. Quilted material mending system. 4,061,096, Cl. 112-121.140.
Elvin, John D. F.: *See—*
Palmer, John P.; Isbister, Stephen W.; and Elvin, John D. F., 4,061,369, Cl. 292-163.000.
Emelyanenko, July Georgievich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.
Emerson, Reginald Stanley, to Leslie Hartridge Limited. Fuel injector testing apparatus. 4,061,027, Cl. 73-119.00A.
Emery, Alvin T.: *See—*
Cook, Edward H., Jr.; and Emery, Alvin T., 4,061,550, Cl. 204-98.000.
EMG Hydraulics, Inc.: *See—*
Greer, Edward M., 4,061,161, Cl. 138-30.000.
Endres, Thomas E.; and Rodeman, Donald W., to General Motors Corporation. Voltage variable capacitor tuned radio receiver having delayed automatic frequency control at turn-on. 4,061,981, Cl. 325-419.000.
Engelfried, Otto: *See—*
Wiechert, Rudolf; Kerb, Ulrich; and Engelfried, Otto, 4,061,661, Cl. 260-397.450.
Engelhard Minerals & Chemicals Corporation: *See—*
Burns, Robert A., 4,061,595, Cl. 252-463.000.
English Clays Lovering Pochin & Company Limited: *See—*
Windle, William, 4,061,502, Cl. 106-72.000.
Enterprise Incorporated: *See—*
Marks, Ronald H.; Marks, Paul D.; and Goodman, Lawrence R., 4,060,999, Cl. 66-125.00A.
Erb, Lee A.: *See—*
Solheim, Fredrick S.; and Erb, Lee A., 4,062,006, Cl. 340-228.00R.
Erdelyi, Gabor. Film with light sound track carrying the stereophonic sound information; ribbon light valve for providing the light sound track as well as light sound adapter for reproducing the information recorded on. 4,061,889, Cl. 179-100.30T.
Eriksoo, Edgar; and Ohlsson, Korfitz Bengt-Ingvar, to Aktiebolaget Leo. Antidepressant composition. 4,061,747, Cl. 424-244.000.
Ernest Scragg & Sons Limited: *See—*
Eaves, Ronald Spencer, 4,060,964, Cl. 57-34.0HS.
Ernst, Alfons, to Dr. Johannes Heidenhain GmbH. Compensation of errors in incremental measuring or positioning instruments. 4,060,903, Cl. 33-125.00R.
Ertel, Hartmut; Heubach, Gunther; and Wolf, Erhard, to Hoechst Aktiengesellschaft. Cyano acetic acid anilide derivatives, process for their manufacture and compositions containing these compounds. 4,061,767, Cl. 424-282.000.
Erwin, Curtis L., Jr. Fuel measuring system for engines and method of monitoring fuel flow. 4,061,024, Cl. 73-114.000.
Escher Wyss GmbH: *See—*
Biondetti, Mario, 4,061,532, Cl. 162-352.000.
Kahmann, Albrecht, 4,061,283, Cl. 241-261.300.
Esco Corporation: *See—*
Hahn, Frederick C.; and Jones, Larren F., 4,061,432, Cl. 403-318.000.
Eskeli, Michael. Thermodynamic machine with step type heat exchangers. 4,060,989, Cl. 60-650.000.
Essen, R. Eric, to Intec Industries Inc. Thermometer case and holder. 4,061,226, Cl. 206-306.000.
Essex Group, Inc.: *See—*
Vogel, Ralph A., 4,061,947, Cl. 318-77.000.
ETA A.G. Ebauches-Fabrik: *See—*
Jakob, Edwin, 4,060,976, Cl. 58-58.000.
Evans, David G., to United States of America, Army. Fail safe battery. 4,061,842, Cl. 429-116.000.
Evans, Dorothy D.: *See—*
Evans, Frank E.; and Evans, Dorothy D., 4,061,360, Cl. 280-652.000.
Evans, Frank E.; and Evans, Dorothy D. Collapsible golf bag cart. 4,061,360, Cl. 280-652.000.
Everett, Peter Kenneth, to Dextec Metallurgical Proprietary Limited. Electrolytic production of copper from ores and concentrates. 4,061,552, Cl. 204-107.000.
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. Uses of α-oxy(oxo) sulfides and ethers in foodstuffs and flavors for foodstuffs. 4,061,795, Cl. 426-535.000.
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. Uses of α-oxy(oxo) sulfides and ethers in foodstuffs and flavors for foodstuffs. 4,061,796, Cl. 426-535.000.
Evode Holdings Limited: *See—*
Counsell, Patrick James Claude; and Whitehouse, Sydney Robert, 4,061,825, Cl. 428-355.000.
Ewald, John S.: *See—*
Last, Anthony J., 4,061,922, Cl. 250-461.00R.
F & B Mfg. Co.: *See—*
Kauffmann, J. H., 4,061,139, Cl. 228-107.000.
Fabian, Emil L. Self-centering toilet valve. 4,060,858, Cl. 4-57.00R.
Fabrichev, Jury Nikolaevich: *See—*
Kaporovich, Vladimir Georgievich; Sereda, Viktor Grigorievich; Udovenko, Vitaly Kirillovich; Zelenskaya, Nadezhda Nikolaevna; Brazhnik, Viktor Yakovlevich; Sviridov, Evgeny Pavlovich; and Fabrichev, Jury Nikolaevich, 4,061,009, Cl. 72-69.000.
Fabris, Hubert J.; Gruber, David P.; Sponseller, David R.; and Uelzmann, Heinz, to General Tire & Rubber Company, The. Copolymers of hydrazides and certain unsaturated esters. 4,061,845, Cl. 526-11.100.
Fadden, Delmar M.: *See—*
Gupta, Alankar; and Fadden, Delmar M., 4,061,996, Cl. 340-27.00R.
Faiczak, John, to Canada Square Management Ltd. Temperature control system. 4,061,185, Cl. 165-48.000.
Fairbank, Raymond Harry: *See—*
Raisbeck, Wesley Paul; Bass, Merlyn Duane; Whicker, Bobbie Dean; Davis, William Clair; and Fairbank, Raymond Harry, 4,061,284, Cl. 241-294.000.
Fairchild Camera and Instrument Corporation: *See—*
Hosack, Harold H., 4,061,530, Cl. 156-653.000.
Falchi, Ennio. Composite cigarette enveloping material. 4,061,147, Cl. 131-4.00A.
Fansteel Inc.: *See—*
Cecka, Andrew M.; and Dano, Pol, 4,061,520, Cl. 156-245.000.
Fariss, James Douglas, Jr., to Innovation Enterprises, Inc. Log splitting device. 4,061,168, Cl. 144-193.00R.
Farr, William. Frame holder. 4,061,321, Cl. 269-41.000.
Farrow, Harold F., to Colorflo Limited. Fluid injector. 4,061,085, Cl. 101-150.000.
Fasano, Osvaldo, to Start S.p.A. Studi Apparecchiature e Richerche Tecniche. Device for automatically compensating for wear in the braking systems of motor vehicles. 4,061,210, Cl. 188-79.50P.
Faulkner, Albert A.: *See—*
Levine, Marshall S.; and Faulkner, Albert A., 4,061,108, Cl. 118-100.000.
Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy R.; and Gouret, Claude J., to Delalande S.A. Pyrimidin-6-yl acethydroxamic acids. 4,061,855, Cl. 544-122.000.
Feess, Erich: *See—*
von der Eltz, Hans-Ulrich; Feess, Erich; and Glander, Siegfried, 4,061,001, Cl. 68-200.000.
Felburn, J. Phil. Vehicle suspensions. 4,061,361, Cl. 280-681.000.
Felker, Paul J.; and Owen, Shubel H. Fractioning autogenous triturator. 4,061,276, Cl. 241-69.000.
Fend, Fritz: *See—*
Reis, August; Fend, Fritz; and Hils, Karl, 4,061,556, Cl. 204-271.000.

Ferguson, William Alexander: *See*—
Washburn, Owen Victor; Kouvarellis, Georgeos Konstandenos; and Ferguson, William Alexander, 4,061,565, Cl. 210-32.000.

Feser, Manfred; Joerchel, Egon; and Korinth, Jurgen, to Hoechst Aktiengesellschaft. Process for preparing concentrated tetrafluoroboric acid. 4,061,723, Cl. 423-276.000.

Fettweis, Alfred, to Siemens Aktiengesellschaft. Filter having frequency-dependent transmission properties for electric analog signals. 4,061,905, Cl. 364-724.000.

Fey, Maurice G.; and Dancy, Edna A., to Westinghouse Electric Corporation. Method of ore reduction with an arc heater. 4,061,492, Cl. 75-10.00R.

Fiber Industries Inc.: *See*—
Talbot, James Richard, 4,060,970, Cl. 57-140.00R.

Ficek, Jan, to Przedsiebiorstwo Projektowania i Wyposazania Zakladow Przemyslu Maszyn i Aparatow Ekejtrtczbtcg "Promel". Apparatus for centrifugal casting in split molds. 4,061,181, Cl. 164-292.000.

Fiedler, Edgar F.; Copas, Gordon A.; and Willey, Arthur F., to Anderson Bros. Mfg. Co. Wrapper end folding and sealing apparatus. 4,060,959, Cl. 53-373.000.

Fielding, Ivor R.: *See*—
Poppe, Wassily; and Fielding, Ivor R., 4,061,835, Cl. 428-522.000.

Filipiev, Oleg Vladimirovich: *See*—
Andoniev, Sergei Mikhailovich; Granovsky, Boris Ruvimovich; Golod, Leonid Davydovich; Kudinov, Gennady Alexandrovich; Kasyanov, Grigory Ivanovich; Filipiev, Oleg Vladimirovich; Tseluiko, Jury Ivanovich; and Lysenko, Evgeny Eliseevich, 4,061,317, Cl. 266-193.000.

Finigan, George D.; May, Brian E.; and Zaininger, Henry W., to Systems Using Nature Ltd. Solar heat educational device. 4,060,916, Cl. 35-10.000.

Finn, Robert K.; Tannahill, Alex L.; and Laptewicz, Joseph E., Jr., to Cornell Research Foundation, Inc. Method of using heteropolysaccharides produced by the fermentation of methanol. 4,061,585, Cl. 252-89.00R.

Firestone Tire & Rubber Company, The: *See*—
Dyki, Joseph J., 4,060,878, Cl. 24-230.00A.

First National Bank of Akron, Trustee, The: *See*—
McGinnis, Hebert E., 4,061,223, Cl. 198-821.000.

Fisch, Ichak: *See*—
Fisch, Shlomo Chaim; and Fisch, Ichak, 4,060,987, Cl. 60-409.000.

Fisch, Shlomo Chaim; and Fisch, Ichak. Turbine drive system. 4,060,987, Cl. 60-409.000.

Fish, Frank L., to Weaver Engineering & Mfg. Co. Pipe pressure testing device. 4,061,015, Cl. 73-49.500.

Fisher, Eugene W. Mobile home fireplace with external air supply. 4,061,127, Cl. 126-120.000.

Fisher, Howard M., to Pennsylvania Engineering Corporation. Metallurgical vessel. 4,061,318, Cl. 266-246.000.

Fitzgerald, James J.; Fortunato, Joseph J.; and Demas, Nickolas P., to Wagner Electric Corporation. Baseless cartridge lamp and socket therefor. 4,061,940, Cl. 313-318.000.

Fixatorenbau Bertuch & Co. GmbH: *See*—
Kober, Hubert Reinhard, 4,061,298, Cl. 248-23.000.

Flanigen, Edith Marie: *See*—
Grose, Robert William; and Flanigen, Edith Marie, 4,061,724, Cl. 423-335.000.

Fleckenstein, Erwin; Heinrich, Ernst; and Mohr, Reinhard, to Cassella Farbwerke Mainkur AG. 2,4,6-Trisubstituted-3-pyridine carboxamides. 4,061,642, Cl. 260-295.50A.

Fleig, Helmut: *See*—
Adolphi, Heinrich; Fleig, Helmut; and Hagen, Helmut, 4,061,762, Cl. 424-270.000.

Flockton, Peter Robin: *See*—
Duffield, Peter Roe; Flockton, Peter Robin; Lillis, Rupert Martin; Turner, Brian Maurice; and Crowell, Donald Edward, 4,061,706, Cl. 264-90.000.

Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; Grudzinskas, Charles Vincent; and Lai Chen, Sow-Mei, to American Cyanamid Company. 15-Deoxy-16-hydroxy-16-vinyl and cyclopropyl substituted prostanoic acids and congeners. 4,061,670, Cl. 260-514.00D.

Floyd, Middleton Brawner, Jr.; McGahren, William James; Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. Derivatives of 9-hydroxy-13-trans-prostenoic acid. 4,061,672, Cl. 260-514.00D.

Fluoroware, Inc.: *See*—
Johnson, Douglas M., 4,061,228, Cl. 206-454.000.

Fondedile S.p.A.: *See*—
Chitis, Wolf, 4,060,994, Cl. 61-53.600.

Ford Motor Company: *See*—
Gondeck, Hans-Ullrich, 4,061,448, Cl. 418-170.000.

Fortunato, Joseph J.: *See*—
Fitzgerald, James J.; Fortunato, Joseph J.; and Demas, Nickolas P., 4,061,940, Cl. 313-318.000.

Foseco International Limited: *See*—
Edwards, Bryan William, 4,061,174, Cl. 164-6.000.

Foster, George B., to Airdata Inc. Approach range monitor. 4,061,297, Cl. 244-184.000.

Foster Wheeler Energy Corporation: *See*—
Gibson, Thomas, 4,061,112, Cl. 122-7.00R.
Guido, Paul Vincent; Criswell, Robert Lenox; and Zipay, Albert John, 4,060,990, Cl. 60-676.000.

Foulkes, Stanley Charles, to Chloride Group Limited. Battery plates. 4,061,843, Cl. 429-136.000.

Fr. Ernst Fehrer Gesellschaft m. b. H. & Co., K.G. Textilmaschinenfabrik und Stahlbau: *See*—
Konig, Franz, 4,060,966, Cl. 57-58.890.

Frame, Robert R.: *See*—
Morgan, Kenneth A.; and Frame, Robert R., 4,061,711, Cl. 423-67.000.

Franco, Jose Asuncion: *See*—
Axvig, Maynard Arnold; and Franco, Jose Asuncion, 4,060,868, Cl. 10-72.00R.

Franklin, William E.; Madacsi, John P.; and Rowland, Stanley P., to United States of America, Agriculture. Creasable durable press textiles from methylol reagents and half amides or half salts of dicarboxylic acids. 4,061,465, Cl. 8-185.000.

Fraser, Graham: *See*—
Gosling, Lincoln John; and Fraser, Graham, 4,060,875, Cl. 17-1.00F.

Fredriksson, Rune Osten Walter; Johansson, Johan Ingvar; and Boye, Erhard Rudolf, to Avesta Jernverks Aktiebolag. Device for performing working operations on a workpiece by detonation of blasting charges. 4,061,261, Cl. 228-2.500.

Freed, Gerald Lewis; and Lerner, David S., to Lockheed Electronics Co., Inc. Synchro-to-digital converter employing common processing apparatus. 4,062,005, Cl. 340-198.000.

Freedman, Harold H.: *See*—
Dubois, Robert A.; and Freedman, Harold H., 4,061,682, Cl. 260-611.00A.

Fregnan, Giancarlo: *See*—
Manghisi, Elso; Cascio, Giuseppe; and Fregnan, Giancarlo, 4,061,637, Cl. 260-268.0PH.

Freifeld, Stephen; and Yanick, Paul, Jr. Audio processor for use in high noise environments. 4,061,875, Cl. 179-1.00P.

Fricke, J. P.; and Muller, Ulrich R. System for reproducing sound information. 4,061,874, Cl. 179-1.00P.

Fridley, Robert B.; Chen, Pictiaw; Mehlschau, James J.; and Claypool, Lawrence L., to University of California, The Regents of the. Deformeter. 4,061,020, Cl. 73-81.000.

Friebel, Eberhard, to Siemens Aktiengesellschaft. Liquid flow meter or the like for corrosive liquids under pressure. 4,061,032, Cl. 73-273.000.

Friedman, Harvey William; and Corey, Donald Wyman, to Buxton, Incorporated. Belt and buckle assembly. 4,060,854, Cl. 2-338.000.

Frisch, Erling: *See*—
Creagan, Robert J.; and Frisch, Erling, 4,061,536, Cl. 176-78.000.

Fritz, Dieter: *See*—
Winkler, Bruno; Mangei, Bernd; and Fritz, Dieter, 4,061,786, Cl. 426-138.000.

Froeschle, Thomas A., to Bose Corporation. Loudspeaker with single layer rectangular wire voice coil wound on slit metal bobbin with a notch in the adjacent pole plate. 4,061,890, Cl. 179-115.5VC.

Frolov, Jury Fedorovich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.

Frye, Burton L.; Pittman, Max G.; Runge, David A.; Souza, Lawrence C.; and LaVoie, Raymond V., to United States of America, Navy. Vacuum cleaner for radioactively contaminated particles. 4,061,480, Cl. 55-356.000.

Fucker, Gregor: *See*—
Schallus, Erich; Mietens, Gerhard; Fucker, Gregor; Petrell, Jurgen; and Dorn, Friedrich Wilhelm, 4,061,719, Cl. 423-445.000.

Fuhri, William F. Carrying case for art supplies. 4,061,224, Cl. 206-1.700.

Fuji Kasui Engineering Co., Ltd.: *See*—
Senjo, Teizo; and Kobayashi, Makio, 4,061,743, Cl. 423-235.000.

Fuji Photo Film Co., Ltd.: *See*—
Fujita, Susumu, 4,062,026, Cl. 354-106.000.

Fujimoto, Sakae; Sue, Takaji; and Misawa, Toshihiko, to Ricoh Co., Ltd. Paper feeder. 4,061,328, Cl. 271-10.000.

Fujita, Susumu, to Fuji Photo Film Co., Ltd. Data recording means for use in a single lens reflex camera. 4,062,026, Cl. 354-106.000.

Fujitsu Limited: *See*—
Ito, Chiaki, 4,061,998, Cl. 340-146.3AC.
Togei, Ryoiku; Takei, Akira; and Wada, Kunihiko, 4,062,037, Cl. 357-24.000.

Fukushima, Tsugio, to Yanmar Diesel Engine Co., Ltd. Exhaust system of an internal combustion engine. 4,060,985, Cl. 60-319.000.

Fukuyama, Kiyoshi: *See*—
Yamasaki, Akitosi; Fukuyama, Kiyoshi; and Miyauchi, Kazunori, 4,061,311, Cl. 254-168.000.

Fumagalli, Carlo; Caprara, Giuseppe; and Roffia, Paolo, to Montedison S.p.A. Process for the manufacture of glycols and glycol nono-esters. 4,061,868, Cl. 560-246.000.

Funakoshi, Satoshi; Omura, Takao; and Ohshiro, Takeshi, to Green Cross Corporation, The. Haptoglobin in aqueous solution and process for preparing the same. 4,061,735, Cl. 424-177.000.

Furutsutsumi, Yasuzi. Apparatus for removing dust having device for producing air curtain. 4,060,874, Cl. 15-405.000.

Futamura, Kazumasa: *See*—
Konishi, Masami; and Futamura, Kazumasa, 4,060,982, Cl. 60-282.000.

G. Hunziker AG: *See*—
Altmann, Jack G., 4,061,374, Cl. 308-1.00R.

Gabarro, Horacio Carlos. Garment. 4,060,853, Cl. 2-108.000.

Gabbard, Ova Gene: *See*—
Walker, Andrew M.; and Gabbard, Ova Gene, 4,061,979, Cl. 325-419.000.

Gachot, Jean; and Lekarski, Simeon. Transition module for a pneumatic sequencer and an associated sequencer. 4,061,156, Cl. 137-109.000.

Gaeth, Rudolf: *See*—
Stastny, Fritz; Gaeth, Rudolf; Haardt, Udo; and Koerner, Heinz-Hermann, 4,061,701, Cl. 264-51.000.

Gagliardi, Renzo, to Snam Progetti S.p.A. Process for the synthesis of urea from carbon dioxide and ammonia. 4,061,675, Cl. 260-555.00A.

Gallivan, Timothy Joseph, to General Electric Company. Fugitive binder for nuclear fuel materials. 4,061,700, Cl. 264-0.500.

Garcia, Onofre S. Sail to row. 4,061,105, Cl. 115-3.000.

Garrett Corporation, The: *See*—
Sullivan, Richard N.; and Vance, John E., 4,061,216, Cl. 192-46.000.

Gausepohl, Hermann: *See*—
Wild, Hans; Jung, Rudolf; Echte, Adolf; Zizlsperger, Johann; and Gausepohl, Hermann, 4,061,858, Cl. 526-67.000.

Gaworowski, Andrew J.: *See*—
Duckett, John C.; Easley, Wayne W.; and Gaworowski, Andrew J., 4,061,818, Cl. 428-246.000.

Gay, Gardiner, to Avco Everett Research Laboratory, Inc. Electron beam window structure for broad area electron beam generators. 4,061,944, Cl. 313-420.000.

Gee, David William; Klassen, Horst Willi; and Rath, Heinrich Bernard, to Girling Limited. Disc brake caliper and support structure. 4,061,209, Cl. 188-73.300.

Geimer, Robert L.; and Lehmann, William F., to United States of America, Agriculture. Combination sheathing support - member building product. 4,061,813, Cl. 428-183.000.

Gell, Harold A., Jr. Orientation system. 4,060,910, Cl. 33-324.000.

Gendo, Indra Lee: *See*—
Collins, Galen R.; May, George A.; and Gendo, Indra Lee, 4,061,880, Cl. 179-15.0BA.

General Electric Company: *See*—
Bean, Charles P.; King, Roy J., Jr.; and Uzgiris, Egidijus E., 4,061,543, Cl. 195-103.50K.
Bobear, William J., 4,061,609, Cl. 260-9.000.
Crouch, Donald Wayne, 4,061,894, Cl. 200-144.00B.
Gallivan, Timothy Joseph, 4,061,700, Cl. 264-0.500.
Girard, Roland T.; and Rice, George A., 4,061,584, Cl. 252-63.000.
Griffis, Daniel L., 4,061,949, Cl. 318-154.000.
Hampton, Thomas L., 4,060,981, Cl. 60-226.00R.
Hay, Allan S., 4,061,617, Cl. 260-47.00R.
Kennedy, Richard W.; and Tefft, Edward G., 4,061,510, Cl. 148-187.000.
Rothenberg, Sidney; and Vostovich, Joseph Edward, 4,061,703, Cl. 264-36.000.
Schroeter, Siegfried H.; and Olson, Daniel R., 4,061,652, Cl. 260-308.00B.
Strok, Jack M., Jr., 4,061,939, Cl. 313-25.000.

General Foods Corporation: *See*—
Cole, Keith M., Jr., 4,061,790, Cl. 426-303.000.

General Motors Corporation: *See*—
Black, Dennis A.; and Brucken, Byron L., 4,061,443, Cl. 417-222.000.
Chupick, Ronald, 4,061,386, Cl. 293-86.000.
Coleman, John R.; and McDaniel, Dwight W., 4,061,346, Cl. 277-205.000.
Davis, Leonard C., 4,061,183, Cl. 165-8.000.
Endres, Thomas E.; and Rodeman, Donald W., 4,061,981, Cl. 325-419.000.
Jacobs, James W., 4,061,000, Cl. 68-23.700.
Mathues, Thomas P., 4,061,429, Cl. 188-206.00A.
Montgomery, James R.; and Saczawa, John S., Jr., 4,061,384, Cl. 293-71.00R.
Paddock, Gordon R., 4,060,984, Cl. 60-290.000.
Parks, Robert R., 4,061,364, Cl. 280-718.000.
Peterson, Philip R.; Taylor, David W.; and Levijoki, Wayne A., 4,061,402, Cl. 303-92.000.
Peterson, Philip R.; and Taylor, David W., 4,061,403, Cl. 303-106.000.
Sharma, Ram A.; Wright, Walter J.; and Murie, Richard A., 4,061,841, Cl. 429-112.000.
Smith, Robert, 4,061,482, Cl. 62-155.000.
Summers, Jack C., 4,061,593, Cl. 252-443.000.

General Signal Corporation: *See*—
Bradley, Robert L.; and Sullivan, Daniel J., 4,061,344, Cl. 277-26.000.

General Tire & Rubber Company, The: *See*—
Fabris, Hubert J.; Gruber, David P.; Sponseller, David R.; and Uelzmann, Heinz, 4,061,845, Cl. 526-11.100.

George, Jay R.; Line, Larry L.; and Reed, David H., to Armstrong Cork Company. Patching technique for damaged, printed design. 4,061,516, Cl. 156-94.000.

George, John. Pedal powered potter's wheel. 4,061,460, Cl. 425-459.000.

George, Peter K., to Rockwell International Corporation. One-level magnetic bubble switching device. 4,062,003, Cl. 365-16.000.

Gerasimenko, Alexandr Yakovlevich: *See*—
Lifshits, Viktor Senderovich; Petrov, Georgy Nikolaevich; Papkov, Oleg Sergeevich; Khomenko, Vladimir Ivanovich; Gerasimenko, Alexandr Yakovlevich; Taradaiko, Alexandr Korneevich; Zemchenko, Alexandr Mikhailovich; and Gremyakov, Ivan Petrovich, 4,061,078, Cl. 90-24.00C.

Gerber, Mark S.: *See*—
Miller, Don W.; and Gerber, Mark S., 4,061,919, Cl. 250-363.00S.

Gere, Sandor. Stressless suspension and anchoring process of stone veneer. 4,060,951, Cl. 52-508.000.

Germanas, Dalia: *See*—
Ryu, Ji-Yong; and Germanas, Dalia, 4,061,689, Cl. 260-671.00R.

Geurts, Petrus T. J.; and Wittenberg, Albert J., to Oce-van der Grinten N.V. Light reflecting casing. 4,061,422, Cl. 350-293.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Heitkamp, Herbert; and Husemann, Heinz, 4,060,992, Cl. 61-41.00A.

Ghent, Roy B. Spring manipulating device. 4,061,308, Cl. 254-10.500.

Giannarelli, Giancarlo; and Movilli, Walter, to Montedison S.p.A. Apparatus for extruding thermoplastic material. 4,061,462, Cl. 425-464.000.

Gibson, Thomas, to Foster Wheeler Energy Corporation. Steam generating plant. 4,061,112, Cl. 122-7.00R.

Gillern, Maurice F., to Weyerhaeuser Company. Phenol-formaldehyde-resorcinol resins and adhesives. 4,061,620, Cl. 260-29.300.

Gillhaus, Horst, to BBC Brown, Boveri & Company Limited. Apparatus for pouring casting material. 4,061,179, Cl. 164-151.000.

Gillitzer, Max; and Tajbl, Franz, to Messer Griesheim GmbH. Arrangement for stabilization and ignition of welding arcs by ignition pulses. 4,061,899, Cl. 219-131.00R.

Gilson, John L.: *See*—
Moschovis, Elias P.; and Gilson, John L., 4,061,582, Cl. 252-62.10L.

Gilwee, William J., Jr.; and Parker, John A., to United States of America, National Aeronautics and Space Administration. Honeycomb-laminate composite structure. 4,061,812, Cl. 428-117.000.

Girard, Roland T.; and Rice, George A., to General Electric Company. High dielectric constant ink for thick film capacitors. 4,061,584, Cl. 252-63.000.

Girling Limited: *See*—
Gee, David William; Klassen, Horst Willi; and Rath, Heinrich Bernard, 4,061,209, Cl. 188-73.300.

Gladwin, Floyd R. Apparatus for forming large compound curved surfaces. 4,061,077, Cl. 90-15.00A.

Glander, Siegfried: *See*—
von der Eltz, Hans-Ulrich; Feess, Erich; and Glander, Siegfried, 4,061,001, Cl. 68-200.000.

Glazer, Joseph, to Morse Safety Products Co. Grinder for glass plates or the like. 4,060,937, Cl. 51-80.00A.

Gleason Works, The: *See*—
Ryan, Arthur B.; and Thomas, Charles B., 4,060,881, Cl. 407-22.000.

Glowaky, Raymond Charles; Rudolph, Stephen Edward; and Bierwagen, Gordon Paul, to Sherwin-Williams Company, The. Coating compositions containing starch half-esters and process for preparing same. 4,061,610, Cl. 260-17.4ST.

Glowaky, Raymond Charles; Rudolph, Stephen Edward; and Bierwagen, Gordon Paul, to Sherwin-Williams Company, The. Aqueous compositions containing starch ester dispersants. 4,061,611, Cl. 260-17.4ST.

Gluecksmann, Alfred: *See*—
Marans, Nelson Samuel; and Gluecksmann, Alfred, 4,061,662, Cl. 560-26.000.

Gobillon, Yves: *See*—
Weidenbach, Guenter; Lecloux, Andre; and Gobillon, Yves, 4,061,713, Cl. 423-213.500.

Goble, Ralph W., to Meinerz, Bernard J., a part interest. Method for filling a container with a liquid saturated with a gas and sealing while avoiding frothing of the liquid. 4,060,956, Cl. 53-22.00R.

Goddard, Donald Lawrence: *See*—
Nolan, John Howard; Goddard, Donald Lawrence; and Short, Barrett John, 4,061,535, Cl. 176-38.000.

Goel, Rajeshwar P.; Vota, Terry L.; and Lynch, Thomas J., to Westinghouse Electric Corporation. Method and apparatus for fabricating vent plate having bow-tie slot arrangement. 4,061,937, Cl. 310-65.000.

Goldberg, Burton D. Novelty coin flipping device. 4,061,338, Cl. 273-138.00R.

Goldman, Abraham; and Datta, Pabitra, to RCA Corporation. Method for making etch-resistant stencil with dichromate-sensitized casein coating. 4,061,529, Cl. 156-644.000.

Goldstein, Marvin Sherwood; Lindsley, John Francis; Allison, William Woodrow; and Price, Charles Dan, to American Cyanamid Company. NO_x control in catalyst manufacture. 4,061,597, Cl. 252-465.000.

Golod, Leonid Davydovich: *See*—
Andoniev, Sergei Mikhailovich; Granovsky, Boris Ruvimovich; Golod, Leonid Davydovich; Kudinov, Gennady Alexandrovich; Kasyanov, Grigory Ivanovich; Filipiev, Oleg Vladimirovich; Tseluiko, Jury Ivanovich; and Lysenko, Evgeny Eliseevich, 4,061,317, Cl. 266-193.000.

Gondeck, Hans-Ullrich, to Ford Motor Company. Drive for the ignition distributor of an internal combustion engine. 4,061,448, Cl. 418-170.000.

Gonzalez, Eduardo E. Solar energy device. 4,061,130, Cl. 126-271.000.

Goodfriend, Harvey J.; Mercik, Henry J., Jr.; and Armstrong, Lee R., to United Technologies Corporation. Full throttle, specific speed

tests in internal combustion engine diagnostics. 4,061,026, Cl. 73-116.000.

Goodman, Lawrence R.: *See—*
Marks, Ronald H.; Marks, Paul D.; and Goodman, Lawrence R., 4,060,999, Cl. 66-125.00A.

Goodrich, David E. Multiple code electronic combination door lock. 4,062,056, Cl. 361-172.000.

Goralski, Christian T., to Dow Chemical Company, The. Quinolinesulfonyl compounds. 4,061,639, Cl. 260-283.00S.

Goranson, Rex W.; and Wick, Raymond V. Bolometer. 4,061,917, Cl. 250-338.000.

Gorvin, John Henry, to Burroughs Wellcome Co. Certain cyclic carbonyl compounds used in the prophylaxis of allergic conditions. 4,061,768, Cl. 424-283.000.

Goslin, John Keith; and Tomlinson, Thomas Clifford, to Imperial Group Limited. Perforating apparatus for articles. 4,061,148, Cl. 131-23.00R.

Gosling, Lincoln John; and Fraser, Graham, to Union Carbide Canada Limited. Apparatus for cutting stuffed sausage casing. 4,060,875, Cl. 17-1.00F.

Goss, John B.; Morrow, William D.; and Corbett, Jack William, to Pedestal Crane Corporation. Crane crosshead assembly mounted on a pedestal. 4,061,230, Cl. 212-70.000.

Gottlieb, Sheldon K. Compositions containing collagen and methods of use for repairing depressed cutaneous scars. 4,061,731, Cl. 424-101.000.

Gottstein, William J.: *See—*
Kaplan, Murray A.; Gottstein, William J.; and Granatek, Alphonse P., 4,061,862, Cl. 544-27.000.

Gould, Jack, to Imperial Chemical Industries Limited. Fibres. 4,061,827, Cl. 428-368.000.

Gouret, Claude J.: *See—*
Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy R.; and Gouret, Claude J., 4,061,855, Cl. 544-122.000.

Goyvaerts, Edward C., to N. V. Joseph Mertens International. Extensible table. 4,061,091, Cl. 108-84.000.

Grabmaier, Josef: *See—*
Aulich, Hubert; and Grabmaier, Josef, 4,061,484, Cl. 65-2.000.

Graham, Clifford Arthur Andrew; and Linehan, Kevin Lawrence, to ICI Australia Limited. Therapeutic composition in substantially rigid block form for use in controlling or preventing bloat in animals. 4,061,728, Cl. 424-14.000.

Graham, Duane W.: *See—*
Cunningham, William L.; and Graham, Duane W., 4,061,238, Cl. 214-750.000.

Graham Magnetics Incorporated: *See—*
Deffeyes, Robert J.; and Tyler, Wesley R., 4,061,824, Cl. 428-328.000.

Granatek, Alphonse P.: *See—*
Kaplan, Murray A.; Gottstein, William J.; and Granatek, Alphonse P., 4,061,862, Cl. 544-27.000.

Grand, Michel: *See—*
Bernard, Jean-Rene; Bousquet, Jacques; and Grand, Michel, 4,061,690, Cl. 260-676.00R.

Grandchamp, Pierre-Andre: *See—*
Burckhardt, Christoph Benedikt; Grandchamp, Pierre-Andre; and Hoffmann, Heinz, 4,061,018, Cl. 73-629.000.

Grandis, Ugolino. Device for pedal operating a motor vehicle transmission control. 4,061,051, Cl. 74-474.000.

Granovsky, Boris Ruvimovich: *See—*
Andoniev, Sergei Mikhailovich; Granovsky, Boris Ruvimovich; Golod, Leonid Davydovich; Kudinov, Gennady Alexandrovich; Kasyanov, Grigory Ivanovich; Filipiev, Oleg Vladimirovich; Tseluiko, Jury Ivanovich; and Lysenko, Evgeny Eliseevich, 4,061,317, Cl. 266-193.000.

Grant, Norman H.: *See—*
Alburn, Harvey E.; Lien, Eric L.; and Grant, Norman H., 4,061,737, Cl. 424-177.000.

Granzer, Ernold: *See—*
Teufel, Hermann; Bartmann, Wilhelm; Granzer, Ernold; and Musil, Josef, 4,061,772, Cl. 424-304.000.

Gray, Gary A.: *See—*
Batchelor, Phillip J.; Traister, Robert L.; Gray, Gary A.; and Marino, Joseph A., 4,062,061, Cl. 364-900.000.

Gray, Gorman D., to Lifetime Carbide Company. Method for attaching cutting tips to cutting tools. 4,061,057, Cl. 76-112.000.

Grebe, Wolfgang; and Buhlmann, Siegfried. Computer for numeric calculation of a plurality of functionally interrelated data units. 4,061,906, Cl. 364-735.000.

Green Cross Corporation, The: *See—*
Funakoshi, Satoshi; Omura, Takao; and Ohshiro, Takeshi, 4,061,735, Cl. 424-177.000.

Green, Derek, deceased; and by Green, Muriel Irene, executrix, to United Kingdom Atomic Energy Authority. Extrusion. 4,061,011, Cl. 72-262.000.

Green, Harold A.: *See—*
Lada, Arnold; Petrocci, Alfonso N.; Green, Harold A.; and Merianos, John J., 4,061,750, Cl. 424-249.000.

Green, James Edmond. Method and apparatus for dual resolution analysis of a scene. 4,061,914, Cl. 250-201.000.

Green, John W., to Westinghouse Electric Corporation. Load tap changer system. 4,061,963, Cl. 323-43.50R.

Green, Muriel Irene, executrix: *See—*
Green, Derek, deceased; and Green, Muriel Irene, executrix, 4,061,011, Cl. 72-262.000.

Greenberg, Charles B., to PPG Industries, Inc. Selective solar energy receiver and method for its production. 4,061,830, Cl. 428-469.000.

Greenstein, Jean. Device for forming dental restorations. 4,060,897, Cl. 32-40.00R.

Greenwood, Michael Peter. Angle measuring device. 4,060,900, Cl. 33-75.00R.

Greer, Edward M., to EMG Hydraulics, Inc. Anti-extrusion grommet assembly for pressure accumulator liquid valve. 4,061,161, Cl. 138-30.000.

Gremyakov, Ivan Petrovich: *See—*
Lifshits, Viktor Senderovich; Petrov, Georgy Nikolaevich; Papkov, Oleg Sergeevich; Khomenko, Vladimir Ivanovich; Gerasimenko, Alexandr Yakovlevich; Taradaiko, Alexandr Korneevich; Zemchenko, Alexandr Mikhailovich; and Gremyakov, Ivan Petrovich, 4,061,078, Cl. 90-24.00C.

Gresch, Heinz: *See—*
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,061,476, Cl. 55-77.000.

Greuter, Hans; and Bellus, Daniel, to Ciba-Geigy Corporation. Process for the production of 2-amino-3-hydroxypyridines. 4,061,644, Cl. 260-296.00R.

Grier, Nathaniel: *See—*
Dybas, Richard A.; Grier, Nathaniel; and Witzel, Bruce E., 4,061,775, Cl. 424-330.000.

Griffis, Daniel L., to General Electric Company. Earth excavator including apparatus for stabilizing performance by compensating for changes in temperature. 4,061,949, Cl. 318-154.000.

Grimsrud, Lars. Combination of flow meter and bubble trap. 4,061,031, Cl. 73-200.000.

Grisar, J. Martin: *See—*
Blohm, Thomas R.; Grisar, J. Martin; and Wiech, Norbert L., 4,061,746, Cl. 424-244.000.

Griverus, Tor Lennart Bernt. Method and device for correcting the output signal from a digital transducer for measuring a physical magnitude or variable. 4,061,030, Cl. 73-194.00E.

Groff, Gaylord L.: *See—*
Petras, Raymond J.; and Groff, Gaylord L., 4,061,826, Cl. 428-356.000.

Groner, Norman Arlo, to Victor United, Inc. Compound bow with cable tensioning assembly. 4,061,124, Cl. 124-23.00R.

Grose, Robert William; and Flanigen, Edith Marie, to Union Carbide Corporation. Crystalline silica. 4,061,724, Cl. 423-335.000.

Gross-Given Manufacturing Company: *See—*
Lotspeich, Joseph A., 4,061,245, Cl. 221-75.000.

Gross, James R.; and McFadden, Russell T., to Dow Chemical Company, The. Flexible water swellable crosslinked polyacrylate film. 4,061,846, Cl. 526-16.000.

Groupement pour les Activites Atomiques et Avancees "GAAA" S.A.: *See—*
Carbonnel, Henri, 4,061,176, Cl. 164-61.000.

Groves, John L. Cant strip machine. 4,061,070, Cl. 83-404.400.

Gruber, David P.: *See—*
Fabris, Hubert J.; Gruber, David P.; Sponseller, David R.; and Uelzmann, Heinz, 4,061,845, Cl. 526-11.100.

Grudzinskas, Charles Vincent: *See—*
Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; Grudzinskas, Charles Vincent; and Lai Chen, Sow-Mei, 4,061,670, Cl. 260-514.00D.

Grumman Allied Industries Inc.: *See—*
Burg, Stanley P., 4,061,483, Cl. 62-268.000.

Grunbaum, Benjamin W.: *See—*
United States of America, National Aeronautics and Space Administration; and Grunbaum, Benjamin W., 4,061,561, Cl. 204-299.00R.

GTE Laboratories Incorporated: *See—*
Kadkade, Prakash G., 4,060,933, Cl. 47-58.000.

GTE Sylvania Incorporated: *See—*
Benda, David; and Davis, Charles A., 4,061,945, Cl. 313-481.000.
Decker, John J.; and Ricards, Charles R., 4,061,163, Cl. 141-7.000.
DiDominico, Mario A.; and Smithgall, Harry E., 4,061,943, Cl. 313-482.000.
Hallett, Joseph L.; and Say, Donald L., 4,061,941, Cl. 313-414.000.
Schreurs, Willy P., 4,061,946, Cl. 313-488.000.

Guerrieri, Salvatore A. Process for conversion of alkaline earth sulfites and bisulfites into oxides and carbonates. 4,061,715, Cl. 423-242.000.

Guido, Paul Vincent; Criswell, Robert Lenox; and Zipay, Albert John, to Foster Wheeler Energy Corporation. Power generation system. 4,060,990, Cl. 60-676.000.

Gulf Research & Development Company: *See—*
Hughes, Richard H.; Jamieson, Donald R.; and Kochhar, Rajindar K., 4,061,847, Cl. 526-49.000.
McKinney, Joel Drexler; Sebulsky, Raynor T.; and Wynne, Francis Edmund, Jr., 4,061,562, Cl. 208-61.000.

Gulf & Western Industries, Inc.: *See—*
Battle, Francis L., 4,061,902, Cl. 364-436.000.
Battle, Francis L., 4,061,903, Cl. 364-436.000.

Gulla, Michael, to Shipley Company Inc. Catalyst composition and method of preparation. 4,061,588, Cl. 252-429.00R.

Gumb, Beverley William; Kuhfus, Gerd; and Cogan, Fredrick Thomas, to Northern Telecom Limited. Multi-outlet adaptor for plug-in telephones. 4,061,411, Cl. 339-159.00R.

Gundlach, Theodore F.; and Hawthorne, Arthur L., to J.M.J. Industries, Inc. Striking plate for disintegrating mill. 4,061,281, Cl. 241-188.00R.

Gunjikar, Narayan Vishwanath. Veterinary compositions for inducing estrus in animals and method. 4,061,733, Cl. 424-143.000.

Gupta, Alankar; and Fadden, Delmar M., to Boeing Company, The. Status monitoring apparatus for BLC systems. 4,061,996, Cl. 340-27.00R.

Gutbrod, Dieter: *See*—
Lahm, Heinrich; and Gutbrod, Dieter, 4,061,061, Cl. 82-2.500.

Guth, Wolfgang: *See*—
Vaeth, Guenter; Ohlinger, Manfred; Stritzinger, Heinz; Schoenafinger, Eduard; Wettstein, Eugen; and Guth, Wolfgang, 4,061,727, Cl. 423-634.000.

Guthrie, James Leverette; and Dighe, Shrikant Vishwanath, to W. R. Grace & Co. Thiol containing compounds and their preparation. 4,061,864, Cl. 560-26.000.

H. H. Robertson Company: *See*—
Self, James M., 4,061,613, Cl. 260-40.00R.
Self, James M., 4,061,614, Cl. 260-40.00R.

Haardt, Udo: *See*—
Stastny, Fritz; Gaeth, Rudolf; Haardt, Udo; and Koerner, Heinz-Hermann, 4,061,701, Cl. 264-51.000.

Haberman, Jack I.: *See*—
Colbert, Richard P.; Dimitriou, George; Jones, Max E.; and Haberman, Jack I., 4,062,012, Cl. 343-7.00A.

Habich, Adolph Broadus, to International Business Machines Corporation. Document receiving apparatus. 4,061,331, Cl. 271-223.000.

Hadek, Vaclav; Somoano, Robert B.; and Rembaum, Alan, to United States of America, National Aeronautics and Space Administration. Durable antistatic coating for polymethylmethacrylate. 4,061,834, Cl. 428-522.000.

Hagen, Helmut: *See*—
Adolphi, Heinrich; Fleig, Helmut; and Hagen, Helmut, 4,061,762, Cl. 424-270.000.

Hager, Bror Olof. Preservative for wood and other fibrous materials. 4,061,500, Cl. 106-15.00R.

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Costales, Manuel; and Hakki, Moustafa I., 4,060,969, Cl. 57-102.000.

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Hall, Gunnar, to A/S Apothekernes Laboratorium for Specialpræparater. Method for recovering and stabilizing fat and fatty substances as well as proteins and proteinous substances from process water. 4,061,568, Cl. 210-44.000.

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Hallett, Joseph L.; and Say, Donald L., to GTE Sylvania Incorporated. CRT electron gun assembly. 4,061,941, Cl. 313-414.000.

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Hamid, Michael A.; and Rowlandson, Lyall G., to Minister of Defense, Canadian Government. Seeded flame microwave power load. 4,061,991, Cl. 333-22.00R.

Hamilton, Earle B. Extractor for removing damaged barrel lock from locking ring of a kilowatt-hour meter. 4,060,884, Cl. 29-256.000.

Hammer, Heiner I., to Schlegel Engineering GmbH. Process for the continuous overlap welding of plastic sheets or panels. 4,061,519, Cl. 156-244.000.

Hampl, Edward F., Jr., to Minnesota Mining and Manufacturing Company. Rare-earth-metal-based thermoelectric compositions. 4,061,505, Cl. 136-238.000.

Hampton, Harvie G. Chain saw safety bar. 4,060,894, Cl. 30-382.000.

Hampton, Thomas L., to General Electric Company. Diverter valve for coannular flows. 4,060,981, Cl. 60-226.00R.

Hamsher, James J., to Caterpillar Tractor Co. Acrylate ester derivatives. 4,061,867, Cl. 560-219.000.

Hanamoto, Yukimitsu: *See*—
Kawanami, Shunpei; and Hanamoto, Yukimitsu, 4,061,005, Cl. 72-30.000.

Hanemann, Horst J.: *See*—
Warshaw, Saul; Loveland, Winton; Hanemann, Horst J.; and Ramaglia, Michael, 4,061,526, Cl. 156-468.000.

Hankins, Norman K.: *See*—
DeMonsy, Richard L.; and Hankins, Norman K., 4,061,872, Cl. 174-138.00F.

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Korger, Heinz, 4,061,355, Cl. 280-605.000.

Hannie, David Eugene; and Ducharme, Gerald Louis, to Eastman Kodak Company. Combination of two timing layers for photographic products. 4,061,496, Cl. 96-29.00D.

Hannig, Kurt; and Wirth, Hanns, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Apparatus for deflection electrophoresis. 4,061,560, Cl. 204-299.00R.

Hannon, David Malcolm; and Hu, Hung Liang, to International Business Machines Corporation. Device for biasing bubble domains. 4,062,002, Cl. 365-27.000.

Hansen, Karl A.; and Hendrickson, I. Glen, to Boeing Company, The. Electromagnetic dent remover with electromagnetic localized work coil. 4,061,007, Cl. 72-56.000.

Hansen, Robert D.: *See*—
Pelletier, Ronald R.; Hansen, Robert D.; and Vanderbush, James J., 4,061,833, Cl. 428-511.000.

Hanser, Paul Edmond, to HWH Corporation. Vehicle leveling system and device therefor. 4,061,309, Cl. 254-86.00H.

Hanson, Charles M., to United States of America, Army. Vuilleumier cycle thermal compressor air conditioner system. 4,060,996, Cl. 62-6.000.

Hanssen, Albert J., to International Telephone and Telegraph Corporation. Reciprocating valve having stem cleaning means. 4,061,157, Cl. 137-242.000.

Harada, Shunichi: *See*—
Hamada, Motoharu; and Harada, Shunichi, 4,061,801, Cl. 427-192.000.

Harper, George S.; and Merriken, Lyal N., to Airpax Electronics, Inc. Circuit breaker with improved delay. 4,062,052, Cl. 361-28.000.

Harrill, Thomas D. Extension cord reel and case. 4,061,290, Cl. 242-96.000.

Harris, Arthur M. Metered valve assembly for dispensing devices. 4,061,251, Cl. 222-402.200.

Harrison, Ronnie M.: *See*—
Tallent, Michael W.; Scaggs, Lee E.; Swain, Allan L.; Harrison, Ronnie M.; and Hendershot, William B., III, 4,062,041, Cl. 358-8.000.

Hartwick, George J. Self-cleaning smoke filter. 4,061,478, Cl. 55-257.0PV.

Harwood, William James; and Snyder, Robert P., to Harwood, William James. Portable tool. 4,061,165, Cl. 144-1.00R.

Hase, Siegfried: *See*—
Baumgartel, Karl Heinz; Altenburg, Dieter; and Hase, Siegfried, 4,061,332, Cl. 271-270.000.

Hasegawa, Katsuji, to Meinan Machinery Works, Inc. Apparatus for cutting off a thickness of wood or veneer from logs. 4,061,169, Cl. 144-213.000.

Hashimoto, Kiyoshi; and Kitamura, Shigeki, to Matsushita Electric Industrial Co., Ltd. Device for generating electrical pulses in response to shaft rotation. 4,061,938, Cl. 310-168.000.

Hashino, Yasuo: *See*—
Hayano, Fusakazu; Hashino, Yasuo; and Ichikawa, Kiyoshi, 4,061,821, Cl. 428-304.000.

Hasselblad, Fritz Victor: *See*—
Hyden, Viktor Holger; and Hasselblad, Fritz Victor, 4,061,141, Cl. 128-214.00R.

Hastings, Stephen G.; Poschel, Bruno P. H.; and Butler, Donald E., to Parke, Davis & Company. Methods for treating cardiovascular disorders. 4,061,756, Cl. 424-263.000.

Hattori, Tatsuo: *See*—
Katsuragawa, Kanzi; Hattori, Tatsuo; Kihara, Keiichi; and Tamabayashi, Hanzo, 4,061,669, Cl. 260-505.00N.

Hatuse, Toshikazu: *See*—
Natori, Minoru; Hatuse, Toshikazu; Kawanobe, Kouhei; Ogawa, Hiroshi; Sekiya, Fukuo; Ebihara, Heihachiro; and Uchino, Misao, 4,060,974, Cl. 58-23.00R.

Hauber, Peter Fritz, to Reflectolite Products Inc. Window latch. 4,061,370, Cl. 292-175.000.

Haun, Gladys M.: *See*—
Haun, William A.; and Haun, Gladys M., 4,060,927, Cl. 43-43.100.

Haun, William A.; and Haun, Gladys M. Fish weight blind binding. 4,060,927, Cl. 43-43.100.

Hauni-Werke Korber & Co., KG: *See*—
Bantien, Jurgen; Bardenhagen, Dietrich; Mielke, Johannes; and Kruse, Friedel, 4,061,234, Cl. 214-6.00M.

Havera, Herbert John; and Strycker, Wallace Glenn, to Miles Laboratories, Inc. Method for using 3-substituted-5-phenyl-5-pyridyl hydantoins as antiarrhythmic agents. 4,061,760, Cl. 424-267.000.

Havranek, Peter Harry: *See*—
Ivarsson, Paul Lennart; and Havranek, Peter Harry, 4,061,501, Cl. 106-44.000.

Hawkins, Kenneth Robert: *See*—
White, William Page; and Hawkins, Kenneth Robert, 4,060,942, Cl. 51-268.000.

Hawkins, St. Elmo. Aircraft wheel rotator. 4,061,294, Cl. 244-103.00S.

Hawthorne, Arthur L.: *See*—
Gundlach, Theodore F.; and Hawthorne, Arthur L., 4,061,281, Cl. 241-188.00R.

Hay, Allan S., to General Electric Company. Oxidation-reduction diphenoquinone-diphenohydroquinone polymers. 4,061,617, Cl. 260-47.00R.

Hayano, Fusakazu; Hashino, Yasuo; and Ichikawa, Kiyoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Semipermeable composite membranes. 4,061,821, Cl. 428-304.000.

Hayashi, Hisao: *See*—
Matsushita, Takeshi; Hayashi, Hisao; and Shibasaki, Mitsuru, 4,062,034, Cl. 357-16.000.

Hayashi, Hitoshi: *See*—
Okamoto, Kiyokazu; and Hayashi, Hitoshi, 4,061,907, Cl. 364-718.000.

Hayashi, Masaki; Tanouchi, Tadao; Ito, Hiroyuki; and Ohyama, Isao, to Ono Pharmaceutical Company. Prostaglandin analogues. 4,061,865, Cl. 560-121.000.

Hayashi, Setsuo: *See*—
Kotezawa, Katsutaka; Onodera, Toshimi; Hayashi, Setsuo; and Shimanuki, Fujio, 4,062,016, Cl. 343-178.000.

Haylock, John Christopher: *See*—
Lofquist, Robert Alden; and Haylock, John Christopher, 4,061,621, Cl. 260-78.00L.

Haynes, Leonard S., to United States of America, Navy. Next address subprocessor. 4,062,058, Cl. 364-200.000.

Hazelrigg, Mark Jonathan, Jr.; and Caldwell, Donald Lee, to Dow Chemical Company, The. Electrolytic cell anode structures containing cobalt spinels. 4,061,549, Cl. 204-98.000.

Heckethorn Manufacturing Co.: *See*—
Callon, Floyd Raymond, 4,061,090, Cl. 108-51.100.

Heil, Walter: *See*—
Sommerkamp, Peter; and Heil, Walter, 4,061,871, Cl. 13-31.000.

Heinemann, William H., Jr.: *See*—
Cary, John W.; and Heinemann, William H., Jr., 4,061,094, Cl. 111-89.000.

Heinrich, Ernst: *See*—
Fleckenstein, Erwin; Heinrich, Ernst; and Mohr, Reinhard, 4,061,642, Cl. 260-295.50A.

Heinsohn, Howard H., Jr.: *See*—
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,061,795, Cl. 426-535.000.
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Heitkamp, Herbert; and Husemann, Heinz, to Gewerkschaft Eisenhutte Westfalia. Method of and apparatus for laying a pipe-line. 4,060,992, Cl. 61-41.00A.

Heizmann, Frieder, to Robert Bosch G.m.b.H. Centering apparatus for sensing alignment of engaging, aligned machine elements, typically screws and bolts with nuts. 4,060,906, Cl. 33-181.00R.

Helfert, Herbert; Langdon, William Keith; and Davis, Pauls, to BASF Wyandotte Corporation. Highly branched polyether polyols of high molecular weight. 4,061,684, Cl. 260-615.00B.

Helm, Edward J.: *See*—
van Ackeren, Joseph; and Helm, Edward J., 4,061,544, Cl. 202-141.000.

Hendershot, William B., III: *See*—
Tallent, Michael W.; Scaggs, Lee E.; Swain, Allan L.; Harrison, Ronnie M.; and Hendershot, William B., III, 4,062,041, Cl. 358-8.000.

Hendrickson, I. Glen: *See*—
Hansen, Karl A.; and Hendrickson, I. Glen, 4,061,007, Cl. 72-56.000.

Hengen, Edward John; and Love, Mahlon Lloyd, to Deere & Company. Self-propelled crop harvester. 4,060,960, Cl. 56-14.600.

Henkel U. Cie: *See*—
Schwarze, Werner; Merk, Wolfgang; and Binder, Volker, 4,061,869, Cl. 526-1.000.

Hennemann, Jean, to Unelec S.A. Tripping device for pre-selection of function for electrical equipment. 4,061,993, Cl. 335-20.000.

Herfeld, Friedrich Walter. Continuous mixing apparatus, especially cooling mixer and a method for producing granulated material. 4,061,275, Cl. 241-46.040.

Hernandez, Gerardo Lopez. Brick. 4,060,952, Cl. 52-593.000.

Herrmann, Manfred Franz: *See*—
Satzinger, Gerhard; and Herrmann, Manfred Franz, 4,061,635, Cl. 544-172.000.

Herrnring, Heinz Gunther, to Montblanc-Simplo GmbH. Socket structure for the ball of a ball point pen refill. 4,061,430, Cl. 401-216.000.

Herron, David K., to Eli Lilly and Company. 7-Substituted-ureido-3-carbamoyloxymethyl cephalosporin antibiotics. 4,061,630, Cl. 544-16.000.

Hershey Foods Corporation: *See*—
Mann, Elton W., 4,061,488, Cl. 71-77.000.

Herz, Alvin E., to L. B. Foster Company. Resilient yoke mountings for vibratory pile drivers and extractors. 4,061,196, Cl. 173-49.000.

Hessenthaler, Herbert C., to Thermoplastice Processes Inc. Compound extrusion die for producing an internally lined extrudate. 4,061,461, Cl. 425-462.000.

Hesston Corporation: *See*—
Anderson, John Dale; Buller, Richard James; and Trego, Allen Thomas, 4,060,961, Cl. 56-294.000.
McCanse, James Edson, 4,061,194, Cl. 172-447.000.

Hetrich, Wayne L., to Corporation for Public Broadcasting. Audio signal monitoring system with display of two signal characteristics. 4,061,042, Cl. 73-647.000.

Heubach, Gunther: *See*—
Ertel, Hartmut; Heubach, Gunther; and Wolf, Erhard, 4,061,767, Cl. 424-282.000.

Hewlett-Packard Co.: *See*—
Walker, William T., 4,061,958, Cl. 363-81.000.

Hexcel Corporation: *See*—
DeMonsy, Richard L.; and Hankins, Norman K., 4,061,872, Cl. 174-138.00F.

Higashinaka, Koichi; and Kai, Tetsuo, to Hitachi Metals, Ltd. Dust controlling loading chute apparatus for particulate material. 4,061,221, Cl. 198-524.000.

Higashitsuji, Ken: *See*—
Nishizawa, Kazuo; Higashitsuji, Ken; and Mori, Yuji, 4,061,557, Cl. 204-277.000.

Higgins, Thomas Engel, to Union Carbide Corporation. Collagen compositions having crosslinking agent incorporated therein and the method of preparing the same. 4,061,787, Cl. 426-140.000.

Hilfman, Lee, to UOP Inc. Hydrocracking of hydrocarbons. 4,061,563, Cl. 208-111.000.

Hilgert, Charles William; and Lobmeyer, Raymond Joseph, to Deere & Company. Inline oil filter assembly. 4,061,576, Cl. 210-437.000.

Hill, George B., to Newspaper Equipment Company. Plate locking structure for press cylinders. 4,061,087, Cl. 101-415.100.

Hillard, Ray Leonard; and Weston, Norma Ann, to American Cyanamid Company. Method for the preparation of mono- or poly [dialkyl or dicycloalkylphosphonylmethyl] aromatic carbocyclic compounds. 4,061,681, Cl. 260-606.50P.

Hille, Arvin A., to Omark Industries, Inc. Non-symmetrical bar with reversible body portion. 4,060,895, Cl. 30-384.000.

Hils, Karl: *See*—
Reis, August; Fend, Fritz; and Hils, Karl, 4,061,556, Cl. 204-271.000.

Himmelmann, Wolfgang, to AGFA-Gevaert Aktiengesellschaft. Process for hardening silver halide photographic layers with organic asymmetric monocarbodiimides. 4,061,499, Cl. 96-111.000.

Hinde, Walter R.: *See*—
Keene, Derek K.; and Hinde, Walter R., 4,061,053, Cl. 74-512.000.

Hirano, Sensaburo: *See*—
Tanaka, Sadaharu; Saito, Sadayuki; and Hirano, Sensaburo, 4,061,319, Cl. 266-281.000.

Hirsch, Allen Frederick, to Ortho Pharmaceutical Corporation. Process for preparation of aliphatic primary sulfamates. 4,061,663, Cl. 260-456.00A.

Hirtle, Michael O'Hara; and Morse, James Edward, to Mattel, Inc. Toy airplane launcher. 4,060,930, Cl. 46-81.000.

Hiss, William K. Measuring assembly for turbine thrust bearings. 4,060,904, Cl. 33-172.00R.

Hitachi, Ltd.: *See*—
Hanma, Kentaro; and Miyazaki, Gentaro, 4,062,044, Cl. 358-21.000.
Kubota, Hitoshi; and Kobayashi, Takashi, 4,061,964, Cl. 324-28.0SE.
Miura, Yoshio; Kobayashi, Kazuhiro; and Kotera, Masao, 4,061,289, Cl. 242-7.130.

Hitachi Metals, Ltd.: *See*—
Higashinaka, Koichi; and Kai, Tetsuo, 4,061,221, Cl. 198-524.000.
Kondo, Takajiro; Asamoto, Toshitaka; and Oki, Tsutomu, 4,060,892, Cl. 30-253.000.

Hixson, Richard M., to Transit Products Company, Inc. Restraining rail mounting assembly. 4,061,269, Cl. 238-17.000.

Hoechst Aktiengesellschaft: *See*—
Bartmann, Wilhelm; Kunstmann, Rudolf; Lerch, Ulrich; and Scholkens, Bernward, 4,061,766, Cl. 424-279.000.
Beck, Gerhard; Kunstmann, Rudolf; Babej, Milos; and Teufel, Hermann, 4,061,671, Cl. 260-514.00D.
Ertel, Hartmut; Heubach, Gunther; and Wolf, Erhard, 4,061,767, Cl. 424-282.000.
Feser, Manfred; Joerchel, Egon; and Korinth, Jurgen, 4,061,723, Cl. 423-276.000.
Hahnke, Manfred; Hohmann, Kurt; and Papenfuhs, Theodor, 4,061,464, Cl. 8-79.000.
Holst, Arno; and Kostrzewa, Michael, 4,061,692, Cl. 260-874.000.
Lang, Hans-Jochen; and Muschaweck, Roman, 4,061,647, Cl. 260-306.70T.
Lang, Hans-Jochen; and Muschaweck, Roman, 4,061,761, Cl. 424-270.000.
Schallus, Erich; Mietens, Gerhard; Fucker, Gregor; Petrell, Jurgen; and Dorn, Friedrich Wilhelm, 4,061,719, Cl. 423-445.000.
Schroter, Herbert, 4,062,031, Cl. 354-299.000.
Teufel, Hermann; Bartmann, Wilhelm; Granzer, Ernold; and Musil, Josef, 4,061,772, Cl. 424-304.000.
Vollmer, Hartfrid; Dany, Franz-Josef; and Wortmann, Joachim, 4,061,696, Cl. 260-930.000.
von der Eltz, Hans-Ulrich; Feess, Erich; and Glander, Siegfried, 4,061,001, Cl. 68-200.000.

Hoehn, Hans: *See*—
Denzel, Theodor; and Hoehn, Hans, 4,061,632, Cl. 544-60.000.

Hoffman, Charles E., to Proctor & Schwartz, Inc. Apparatus for treating material with a gaseous medium. 4,060,914, Cl. 34-219.000.

Hoffman, Gordon Bates: *See*—
Callahan, Michael James, Jr.; and Hoffman, Gordon Bates, 4,061,886, Cl. 179-84.0VF.

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Hoffman, Robert F.: *See*—
Bertozzi, Eugene R.; Hoffman, Robert F.; and Barclay, Robert, 4,061,612, Cl. 260-31.40R.

Hoffmann, Heinz: *See*—
Burckhardt, Christoph Benedikt; Grandchamp, Pierre-Andre; and Hoffmann, Heinz, 4,061,018, Cl. 73-629.000.
Hoffmann-La Roche Inc.: *See*—
Burckhardt, Christoph Benedikt; Grandchamp, Pierre-Andre; and Hoffmann, Heinz, 4,061,018, Cl. 73-629.000.
Demny, Thomas Casimir; and Maehr, Hubert, 4,061,542, Cl. 195-80.00R.
Hajos, Zoltan George, 4,061,679, Cl. 260-586.00F.
Klaus, Michael Josef; and Pawson, Beverly Ann, 4,061,656, Cl. 260-332.20A.
Scherrer, Hanspeter; and Boller, Arthur, 4,061,587, Cl. 252-299.000.
Szkrybalo, William, 4,061,489, Cl. 71-88.000.
Hogan, Thomas Leo: *See*—
Lang, Robert S.; Post, Rodney Morris; and Hogan, Thomas Leo, 4,060,946, Cl. 52-169.700.
Hoganas AB: *See*—
Ivarsson, Paul Lennart; and Havranek, Peter Harry, 4,061,501, Cl. 106-44.000.
Hohbach, Harold C.: *See*—
Burroughs, Viola F.; Vahl, Hasso G.; and Wahl, Harro W. D., 4,061,518, Cl. 156-232.000.
Hohmann, Kurt: *See*—
Hahnke, Manfred; Hohmann, Kurt; and Papenfuhs, Theodor, 4,061,464, Cl. 8-79.000.
Hokkaido University, The President of: *See*—
Iwane, Waro, 4,062,045, Cl. 358-88.000.
Holloway, Donald F.: *See*—
Brodnyan, John G.; Holloway, Donald F.; and Le Sota, Stanley, 4,061,822, Cl. 428-315.000.
Holloway, Thomas M.: *See*—
Ley, Ralph M., Jr.; Alyea, Harold W.; and Holloway, Thomas M., 4,061,266, Cl. 236-49.000.
Holmstedt, Goran Solve: *See*—
Carlsson, Carl-Eric Waldenburg; and Holmstedt, Goran Solve, 4,062,008, Cl. 340-323.00R.
Holst, Arno; and Kostrzewa, Michael, to Hoechst Aktiengesellschaft. Process for the manufacture of swellable, absorptive polymers of polyhydroxy methylene. 4,061,692, Cl. 260-874.000.
Holst, Preben Lindholm: *See*—
Madsen, Hans Berg; Holst, Preben Lindholm; and Solli, Houk, 4,061,757, Cl. 424-263.000.
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, to Holter, Heinz. Gas purification method and apparatus. 4,061,476, Cl. 55-77.000.
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Hooker Chemicals & Plastics Corporation: *See*—
Cook, Edward H., Jr.; and Emery, Alvin T., 4,061,550, Cl. 204-98.000.
Maul, James J.; and Pattison, Victor A., 4,061,688, Cl. 260-651.00F.
Hooker, James A.: *See*—
Easter, Rollen G.; and Hooker, James A., 4,061,073, Cl. 85-62.000.
Hoover Ball and Bearing Company: *See*—
Kitchen, John P.; and Riddle, Neville L., 4,060,862, Cl. 5-260.000.
Hope Co. Ltd.: *See*—
Murata, Masahiro, 4,061,358, Cl. 280-629.000.
Horie, Koji; and Mune, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Hosei Brake Industry Company. Process for bending metal sheet. 4,061,098, Cl. 113-116.00Q.
Horii, Sadashige: *See*—
Kimura, Rokusaburo; and Horii, Sadashige, 4,060,972, Cl. 58-16.00D.
Horstmann, Harald; Meng, Karl; and Wehinger, Egbert, to Bayer Aktiengesellschaft. 1-Substituted-3-amino-pyrazol-5-ones. 4,061,653, Cl. 548-360.000.
Hosack, Harold H., to Fairchild Camera and Instrument Corporation. Process for producing successive stages of a charge coupled device. 4,061,530, Cl. 156-653.000.
Hosei Brake Industry Company: *See*—
Horie, Koji; and Mune, Takashi, 4,061,098, Cl. 113-116.00Q.
Hoshino, Kazuo; and Tanbara, Masakazu, to Nissan Motor Co., Ltd. Internal shoe drum brake. 4,061,211, Cl. 188-79.50P.
Hosoi, Kameo: *See*—
Yoshida, Toru; Hosoi, Kameo; Yoshida, Tokuzo; Shimizu, Kazuyuki; and Nakagawa, Koithiro, 4,060,913, Cl. 34-80.000.
Hotten, Terrence Michael: *See*—
Chakrabarti, Jiban Kumar; Hotten, Terrence Michael; and Tupper, David Edward, 4,061,774, Cl. 424-325.000.
Howarth, Thomas Trefor, to Beecham Group Limited. Clavulanic acid sulphates. 4,061,649, Cl. 260-307.0FA.
Hsu, Li-Chen, to United States of America, National Aeronautics and Space Administration. Trimerization of aromatic nitriles. 4,061,856, Cl. 544-193.000.
Hu, Hung Liang: *See*—
Hannon, David Malcolm; and Hu, Hung Liang, 4,062,002, Cl. 365-27.000.
Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, to Bayer Aktiengesellschaft. Phosphorus containing flame retarding agents which are reactive with isocyanates. 4,061,697, Cl. 260-944.000.
Hughes, James C. Ignition device for engines. 4,061,120, Cl. 123-143.00A.
Hughes, Richard H.; Jamieson, Donald R.; and Kochhar, Rajindar K., to Gulf Research & Development Company. Ethylene polymer acidification process. 4,061,847, Cl. 526-49.000.
Hughes Tool Company: *See*—
Hall, James R., 4,061,967, Cl. 324-260.000.
Hults, Harold W., to Cutler-Hammer, Inc. Higher rated double-pole trigger switch. 4,061,895, Cl. 200-157.000.
Hunts, Ronald M.: *See*—
Strange, Delbert D.; and Hunts, Ronald M., 4,061,437, Cl. 408-42.000.
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Huret, Roger H.; and Huret, Jacques A., 4,061,048, Cl. 74-242.000.
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Hurst, Billy L. Adjustable carrying case system. 4,061,259, Cl. 224-51.000.
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Husted, Allen. Golf swing aid. 4,061,340, Cl. 273-189.00R.
Hutkin, Irving J. Plastic-metal composite and method of making the same. 4,061,837, Cl. 428-609.000.
HWH Corporation: *See*—
Hanser, Paul Edmond, 4,061,309, Cl. 254-86.00H.
Hycel, Inc.: *See*—
DuBose, Charles Ray, 4,061,469, Cl. 23-253.00R.
Hycom Incorporated: *See*—
Motley, David M.; and Kameya, Andrew M., 4,061,977, Cl. 325-323.000.
Motley, David M.; Salman, Naif D.; and Cheng, King Y., 4,061,978, Cl. 325-324.000.
Hyden, Viktor Holger; and Hasselblad, Fritz Victor. Apparatus and method for selectively separating amino acids and defined proteins in blood. 4,061,141, Cl. 128-214.00R.
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Cunningham, William L.; and Graham, Duane W., 4,061,238, Cl. 214-750.000.
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Hayano, Fusakazu; Hashino, Yasuo; and Ichikawa, Kiyoshi, 4,061,821, Cl. 428-304.000.
ICI Australia Limited: *See*—
Graham, Clifford Arthur Andrew; and Linehan, Kevin Lawrence, 4,061,728, Cl. 424-14.000.
Ideal Security Hardware Corporation: *See*—
Waldo, Russell W., 4,061,383, Cl. 292-335.000.
Idelson, Elbert M., to Polaroid Corporation. Novel tetrazaporphins. 4,061,654, Cl. 260-314.500.
Igelbuscher, Heinrich: *See*—
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,061,476, Cl. 55-77.000.
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Iizuka, Haruhiko; Matsumoto, Junichiro; and Kato, Fumiaki, to Nissan Motor Co., Ltd. Fuel injection control system for an internal combustion engine of a vehicle. 4,061,055, Cl. 74-866.000.
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Kikumoto, Ryoji; Tobe, Akihiro; and Ikoma, Hidenobu, 4,061,776, Cl. 424-330.000.
Illy, Hugo: *See*—
Kirchmayr, Rudolf; and Illy, Hugo, 4,061,604, Cl. 260-2.5AJ.
Imperial Chemical Industries Limited: *See*—
Gould, Jack, 4,061,827, Cl. 428-368.000.
Turner, Mervyn Edward Dennant, 4,061,714, Cl. 423-220.000.
Imperial Group Limited: *See*—
Goslin, John Keith; and Tomlinson, Thomas Clifford, 4,061,148, Cl. 131-23.00R.
Inaba, Haruji: *See*—
Kitamura, Tatsuzo; and Inaba, Haruji, 4,061,559, Cl. 204-106.000.
Inagami, Kaoru; Mitsui, Isamu; Nakamura, Chomatsu; and Nozaka, Toru, to Calpis Shokuhin Kogyo Kabushiki Kaisha. Method of manufacturing a beverage containing fruit ingredients. 4,061,792, Cl. 426-330.200.
Inai, Yuichi: *See*—
Kijima, Shizumasa; Yamatsu, Isao; Minami, Norio; and Inai, Yuichi, 4,061,660, Cl. 260-396.00R.
Index-Werke KG Hahn & Tessky: *See*—
Lahm, Heinrich; and Gutbrod, Dieter, 4,061,061, Cl. 82-2.500.
Trautmann, Gunther, 4,061,060, Cl. 82-3.000.
Indexomatic, Inc.: *See*—
Robertson, Donald A., 4,061,076, Cl. 90-11.00A.
Ingle, Morton Blakeman: *See*—
Boyer, Ernest Wendell; and Ingle, Morton Blakeman, 4,061,541, Cl. 195-66.00R.
Innovation Enterprises, Inc.: *See*—
Fariss, James Douglas, Jr., 4,061,168, Cl. 144-193.00R.
Inokuchi, Takahiro, to Toko, Inc. Helical resonator filter. 4,061,992, Cl. 333-73.00R.
Inoue, Hayao: *See*—
Sato, Fumio; Sakamoto, Teruo; Watashiro, Seiichi; Inoue, Hayao; and Yahata, Yoshihito, 4,061,164, Cl. 141-90.000.
Inoue, Yasuhiko: *See*—
Itoh, Iko; Inoue, Yasuhiko; and Nagaoka, Kenji, 4,061,844, Cl. 526-4.000.

Institut Francais du Petrole: *See—*
Leleu, Gerard; Bedague, Pierre; and Sillion, Bernard, 4,061,581, Cl. 252-32.70E.
Intec Industries Inc.: *See—*
Essen, R. Eric, 4,061,226, Cl. 206-306.000.
Inter-American Transport Equipment Company: *See—*
Suarez, Diego Rolando, 4,061,235, Cl. 214-64.000.
International Business Machines Corporation: *See—*
Abbas, Shakir Ahmed; and Dockerty, Robert Charles, 4,062,040, Cl. 357-54.000.
Cuomo, Jerome John; DiStefano, Thomas Herman; and Rosenberg, Robert, 4,062,038, Cl. 357-30.000.
Habich, Adolph Broadus, 4,061,331, Cl. 271-223.000.
Hannon, David Malcolm; and Hu, Hung Liang, 4,062,002, Cl. 365-27.000.
Nussbaumer, Henri J., 4,062,060, Cl. 364-724.000.
Van Hook, Danny Allen, 4,060,907, Cl. 33-184.500.
International Computers Limited: *See—*
Dean, Anthony James, 4,061,969, Cl. 324-73.0PC.
International Flavors & Fragrances Inc.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,061,795, Cl. 426-535.000.
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,061,796, Cl. 426-535.000.
Hall, John B.; and Weigers, Wilhelmus Johannes, 4,061,686, Cl. 260-631.00R.
International Harvester Company: *See—*
Beck, Harold D., 4,061,188, Cl. 165-122.000.
Orth, Harold R.; and Swanson, William C., 4,061,079, Cl. 91-372.000.
International Standard Electric Corporation: *See—*
Andre, Wolfram, 4,061,942, Cl. 313-417.000.
Minks, Werner, 4,061,994, Cl. 335-202.000.
International Telephone and Telegraph Corporation: *See—*
Bauerkemper, Michael I., 4,061,522, Cl. 156-305.000.
Hanssen, Albert J., 4,061,157, Cl. 137-242.000.
Ohlstein, Herbert, 4,061,263, Cl. 228-124.000.
INTERx Research Corporation: *See—*
Bodor, Nicolae S., 4,061,722, Cl. 424-273.00R.
Bodor, Nicolae S.; and Sloan, Kenneth B., 4,061,753, Cl. 424-253.000.
Inventa AG fur Forschung und Patentverwertung: *See—*
Schaaf, Siegfried, 4,061,619, Cl. 260-29.20N.
Iowa State University Research Foundation, Inc.: *See—*
Baldwin, William I.; and Buchele, Wesley F., 4,061,021, Cl. 73-84.000.
Irie, Kenji: *See—*
Yamada, Hirotada; Okamura, Kosaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,061,748, Cl. 424-246.000.
Isbister, Stephen W.: *See—*
Palmer, John P.; Isbister, Stephen W.; and Elvin, John D. F., 4,061,369, Cl. 292-163.000.
Ishigaki, Masahiro: *See—*
Yoshida, Akira; Kubo, Taketoshi; Yamajo, Mashayuki; and Ishigaki, Masahiro, 4,061,172, Cl. 152-379.100.
Ishii, Toyota: *See—*
Takase, Hideo; Ishii, Toyota; and Nishiumi, Shiro, 4,061,811, Cl. 428-95.000.
Ishikawa, Kazuo, to Aisin Seiki Kabushiki Kaisha. Engine exhaust brake controlled by transmission and accelerator. 4,061,215, Cl. 192-4.00A.
Ishikawa, Soji. Medical administering needle assembly with filter means. 4,061,143, Cl. 128-218.00N.
Istituto Luso Farmaco d'Italia S.r.l.: *See—*
Manghisi, Elso; Cascio, Giuseppe; and Fregnan, Giancarlo, 4,061,637, Cl. 260-268.0PH.
Ito, Chiaki, to Fujitsu Limited. Character recognition equipment. 4,061,998, Cl. 340-146.3AC.
Ito, Fumio: *See—*
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Mashaharu; and Shinoda, Nobuhiko, 4,062,022, Cl. 354-38.000.
Ito, Hiroyuki: *See—*
Hayashi, Masaki; Tanouchi, Tadao; Ito, Hiroyuki; and Ohyama, Isao, 4,061,865, Cl. 560-121.000.
Ito, Tadashi: *See—*
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Mashaharu; and Shinoda, Nobuhiko, 4,062,022, Cl. 354-38.000.
Itoh, Akio: *See—*
Kuroda, Nobuyuki; Shiraishi, Takeichi; Itoh, Akio; Matsuura, Kazuo; and Miyoshi, Mituji, 4,061,857, Cl. 526-114.000.
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ITW Limited: *See—*
Palmer, John P.; Isbister, Stephen W.; and Elvin, John D. F., 4,061,369, Cl. 292-163.000.
Iura, Yukio: *See—*
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,062,028, Cl. 354-152.000.
Ivanova, Raisa Vasilievna; Belsky, Arkady Andreevich; Novikov, Nikolai Alexandrovich; Alexeeva, Nina Nikolaevna; Nikitina, Ljudmila Nikolaevna; Ljubimova, Nina Andreevna; and Dotsenko, Anna Evgenievna. Process for extraction of gallium from alkaline gallium-containing solutions. 4,061,551, Cl. 204-105.00R.
Ivarsson, Paul Lennart; and Havranek, Peter Harry, to Hoganas AB. Refractory linings. 4,061,501, Cl. 106-44.000.
Iwane, Waro, to Hokkaido University, The President of. Three-dimensional television system. 4,062,045, Cl. 358-88.000.
Iwasaki, Tameo: *See—*
Miyoshi, Munetsugu; Matsumoto, Kazuo; Urabe, Yuji; and Iwasaki, Tameo, 4,061,650, Cl. 260-307.00F.
Izawa, Akio: *See—*
Yamada, Hirotada; Okamura, Kosaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,061,748, Cl. 424-246.000.
Izumi, Tsugio: *See—*
Kanegae, Junji; Izumi, Tsugio; and Mandai, Akio, 4,061,798, Cl. 426-607.000.
J. I. Case Company: *See—*
Dunn, Donnell Lynn, 4,061,201, Cl. 180-133.000.
J.M.J. Industries, Inc.: *See—*
Gundlach, Theodore F.; and Hawthorne, Arthur L., 4,061,281, Cl. 241-188.00R.
Jablin, Richard. Coke oven gas contact with liquor concentrate. 4,061,531, Cl. 159-48.00L.
Jackson, George Oliver, to United Kingdom Atomic Energy Authority. Nuclear reactors. 4,061,534, Cl. 176-37.000.
Jackson, John Lambert: *See—*
Archibald, John Leheup; and Jackson, John Lambert, 4,061,641, Cl. 260-293.610.
Jacob, Jose T., to Chemed Corporation. Corrosion inhibitor for cooling water systems. 4,061,589, Cl. 252-389.00A.
Jacobs, James W., to General Motors Corporation. Belt drive arrangement for agitator washer mechanism. 4,061,000, Cl. 68-23.700.
Jacobsen, Arnold Ralph; and Jaffe, I. Pompe, to Skyhook Sales Corporation. Suspended shelf bracket. 4,061,092, Cl. 108-149.000.
Jacoby, Marvin; and La Porta, Guido A. Universal angulometer. 4,061,924, Cl. 250-476.000.
Jaeger, Heimo, to Vereinigte Edelstahlwerke Aktiengesellschaft (VEW). Method for removing undesired elements, particularly H_2 and O_2, in electroslag remelting and an arrangement for carrying out the method. 4,061,493, Cl. 75-10.00C.
Jaffe Acoustics, Inc.: *See—*
Jaffe, J. Christopher, 4,061,876, Cl. 179-1.0AT.
Jaffe, I. Pompe: *See—*
Jacobsen, Arnold Ralph; and Jaffe, I. Pompe, 4,061,092, Cl. 108-149.000.
Jaffe, J. Christopher, to Jaffe Acoustics, Inc. Electronic sound enhancing system. 4,061,876, Cl. 179-1.0AT.
Jager, Philipp, to Siemens Aktiengesellschaft. Apparatus for controlling the electrolyte concentration of fuel cell batteries. 4,061,838, Cl. 429-22.000.
Jahn, Walter, to JENAer Glaswerk, Schott & Gen. Process for the manufacture of optical bodies with refractive index gradients. 4,061,486, Cl. 65-18.000.
Jahnke, Richard William, to Lubrizol Corporation, The. Thickened aqueous compositions for well treatment. 4,061,580, Cl. 252-8.55R.
Jakob, Edwin, to ETA A.G. Ebauches-Fabrik. Calendar ring driving wheel for timepieces. 4,060,976, Cl. 58-58.000.
Jamerson, Donald W. Template for lining sheet music paper. 4,060,901, Cl. 33-108.000.
Jamieson, Donald R.: *See—*
Hughes, Richard H.; Jamieson, Donald R.; and Kochhar, Rajindar K., 4,061,847, Cl. 526-49.000.
Jamison, Howard M., to United States of America, Army. Optical alignment device and method of use. 4,061,426, Cl. 356-138.000.
Jan Vader, Reinout. Electric energy conversion apparatus. 4,061,957, Cl. 363-22.000.
Janes, Robert W. Engine de-compression mechanism. 4,061,123, Cl. 123-198.00F.
Jaschke, Reinhold: *See—*
Birkenfeld, Richard; and Jaschke, Reinhold, 4,060,957, Cl. 53-26.000.
JENAer Glaswerk, Schott & Gen.: *See—*
Jahn, Walter, 4,061,486, Cl. 65-18.000.
Jensen, Richard H.; and Parris, Peter P., to Brooks & Perkins, Incorporated. Container and door. 4,060,936, Cl. 49-465.000.
Jeppson, Nils: *See—*
Carlsson, Carl-Eric Waldenburg; and Holmstedt, Goran Solve, 4,062,008, Cl. 340-323.00R.
Jimmy Dean Meat Company, Inc., The: *See—*
Bernard, Vincent E., 4,060,998, Cl. 62-320.000.
Joerchel, Egon: *See—*
Feser, Manfred; Joerchel, Egon; and Korinth, Jurgen, 4,061,723, Cl. 423-276.000.
Johansson, Johan Ingvar: *See—*
Fredriksson, Rune Osten Walter; Johansson, Johan Ingvar; and Boye, Erhard Rudolf, 4,061,261, Cl. 228-2.500.
John Dale Limited: *See—*
Brownbill, Thomas Duncan, 4,061,240, Cl. 215-270.000.
John Wyeth & Brother Limited: *See—*
Archibald, John Leheup; and Jackson, John Lambert, 4,061,641, Cl. 260-293.610.
Archibald, John Leheup, 4,061,758, Cl. 424-263.000.
Black, Robin Michael, 4,061,754, Cl. 424-258.000.
Cavalla, John Frederick; and Archibald, John Leheup, 4,061,640, Cl. 260-287.0CE.

Johnson, Bruce C.: *See*—
McBain, Robert T.; and Johnson, Bruce C., 4,060,978, Cl. 59-78.000.

Johnson Controls, Inc.: *See*—
Ley, Ralph M., Jr.; Alyea, Harold W.; and Holloway, Thomas M., 4,061,266, Cl. 236-49.000.

Johnson, Curtis D.; McFarland, Larry C.; and Antwiler, Lonnie D., to United States of America, Army. Ammunition feed mechanism. 4,061,074, Cl. 89-33.0CA.

Johnson, Douglas M., to Fluoroware, Inc. Shipping container for substrates. 4,061,228, Cl. 206-454.000.

Johnson, Matthey & Co., Limited: *See*—
Selman, Gordon Leslie; and Midgley, Richard John, 4,061,495, Cl. 75-134.00F.

Joly, Jean Claud: *See*—
Dechelette, Helen; and Joly, Jean Claud, 4,060,890, Cl. 29-628.000.

Jones, Glenn C.; and Meen, Ronald H., to Eastman Kodak Company. Electrolytic hydroquinone process. 4,061,548, Cl. 204-78.000.

Jones, Henry B.; and Bunn, Dorrance P., Jr., to Texaco Inc. High temperature and shock resistant insulated pipe. 4,061,162, Cl. 138-147.000.

Jones, Howard: *See*—
Shen, Tsung-Ying; Jones, Howard; and Dorn, Conrad P., 4,061,759, Cl. 424-263.000.

Jones, Ivor Wynn; Robinson, Graham; and Bird, Thomas Lewis, to Electricity Council, The. Sodium sulphur cells. 4,061,840, Cl. 429-104.000.

Jones, Larren F.: *See*—
Hahn, Frederick C.; and Jones, Larren F., 4,061,432, Cl. 403-318.000.

Jones, Max E.: *See*—
Colbert, Richard P.; Dimitriou, George; Jones, Max E.; and Haberman, Jack I., 4,062,012, Cl. 343-7.00A.

Jung, Rudolf: *See*—
Wild, Hans; Jung, Rudolf; Echte, Adolf; Zizlsperger, Johann; and Gausepohl, Hermann, 4,061,858, Cl. 526-67.000.

Kabas, Guglielmo: *See*—
Kormany, Geza; Kabas, Guglielmo; Schlapfer, Hans; and Siegrist, Adolf Emil, 4,061,860, Cl. 542-462.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Asano, Kazuhiro, 4,061,929, Cl. 307-246.000.
Katagiri, Yoshio, 4,061,417, Cl. 350-159.000.

Kabushiki Kaisha Daisho: *See*—
Matsuura, Haruo, 4,060,893, Cl. 30-310.000.

Kabushiki Kaisha Fuji Seisakusho: *See*—
Sasaki, Hiromichi, 4,060,919, Cl. 40-104.00A.

Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, 4,061,808, Cl. 428-42.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Nishimura, Izuhiko, 4,062,039, Cl. 357-51.000.

Kadkade, Prakash G., to GTE Laboratories Incorporated. Tissue culture technique utilizing a specific light source. 4,060,933, Cl. 47-58.000.

Kahmann, Albrecht, to Escher Wyss GmbH. Refiner for grinding of fibrous material. 4,061,283, Cl. 241-261.300.

Kahr, Kurt; Pohl, Hanns; Rapp, Guenther; and Lauz, Peter, to BASF Aktiengesellschaft. Partial dehydration of cyclohexanone oxime. 4,061,677, Cl. 260-566.00A.

Kai, Tetsuo: *See*—
Higashinaka, Koichi; and Kai, Tetsuo, 4,061,221, Cl. 198-524.000.

Kaiser Resources Ltd.: *See*—
Parkes, David M., 4,061,398, Cl. 299-17.000.

Kali-Chemie Aktiengesellschaft: *See*—
Weidenbach, Guenter; Lecloux, Andre; and Gobillon, Yves, 4,061,713, Cl. 423-213.500.

Kalopissis, Gregoire; Bouillon, Claude; and Vayssie, Charles, to Societe Anonyme dite: L'Oreal. Anti-solar agent and compositions containing the same. 4,061,730, Cl. 424-59.000.

Kaluza, Hans-Joachim: *See*—
Brauner, Dieter; Kaluza, Hans-Joachim; and Muschelknautz, Edgar, 4,061,313, Cl. 366-340.000.

Kameya, Andrew M.: *See*—
Motley, David M.; and Kameya, Andrew M., 4,061,977, Cl. 325-323.000.

Kamiya, Shigemitsu, to Nippon Zeon Co. Ltd. Resin composition. 4,061,693, Cl. 260-876.00R.

Kamyr, Inc.: *See*—
Laakso, Oliver A.; and Sherman, Michael I., 4,061,193, Cl. 162-19.000.

Kanazawa, Shogo: *See*—
Yokokawa, Takao; Kanazawa, Shogo; Otoguro, Yasuo; Suzuki, Nobukazu; Akase, Sigeyuki; Miida, Noboru; Akazawa, Tadahisa; and Kuroiwa, Kazuya, 4,061,494, Cl. 75-124.000.

Kandpal, Tara, to Tecumseh Products Company (Compressor). Overload protector mounting apparatus. 4,061,935, Cl. 310-68.00C.

Kanebo, Ltd.: *See*—
Sugimoto, Isao; and Sawase, Yoko, 4,061,744, Cl. 424-243.000.

Kanegae, Junji; Izumi, Tsugio; and Mandai, Akio. Method for preparing hard butters from palm oil. 4,061,798, Cl. 426-607.000.

Kanno, Hideyuki, to Tomy Kogyo Co., Inc. Disc bowling game. 4,061,334, Cl. 273-126.00A.

Kano, Hideo: *See*—
Yukinaga, Hisajiro; Kano, Hideo; and Ogata, Masaru, 4,061,490, Cl. 71-68.000.

Kanojia, Ramesh M.; and Levine, Seymour D., to Ortho Pharmaceutical Corporation. Isolation of utero-evacuant substances from plant extracts. 4,061,739, Cl. 424-195.000.

Kaplan, Murray A.; Gottstein, William J.; and Granatek, Alphonse P., to Bristol-Myers Company. Derivatives of 7-(cyclized)phenylglycyl-3-triazolo-thio methyl cephalosporin. 4,061,862, Cl. 544-27.000.

Kaplan, Ricardo Gabriel. Separators for spacing records. 4,061,341, Cl. 274-1.00R.

Kaporovich, Vladimir Georgievich; Sereda, Viktor Grigorievich; Udovenko, Vitaly Kirillovich; Zelenskaya, Nadezhda Nikolaevna; Brazhnik, Viktor Yakovlevich; Sviridov, Evgeny Pavlovich; and Fabrichev, Jury Nikolaevich. Machine for spinning tubular workpieces. 4,061,009, Cl. 72-69.000.

Kaprelian, Edward K.; and Mimmack, William E., to Questar Corporation. Catadioptric lens system. 4,061,420, Cl. 350-199.000.

Karl Schmidt GmbH: *See*—
Diez, Adolf, 4,061,182, Cl. 164-309.000.

Karlsson, Birgitta Gunilla: *See*—
Af Ekenstam, Bo Thuresson; Aurell, Leif Eric; Claeson, Karl Goran; and Karlsson, Birgitta Gunilla, 4,061,625, Cl. 260-112.50R.

Karlsson, Jarding Urban; and Svensson, Hugo Ragnvald, to ABU Aktiebolag. Ring-shaped line protecting element for use in fishing reels. 4,061,288, Cl. 242-84.10K.

Karrer, Friedrich, to Ciba-Geigy Corporation. Diphenyl ether derivatives. 4,061,683, Cl. 260-613.00R.

Kashina, Valentina Fedorovna: *See*—
Blyakhman, Lazar Isaevich; Davydov, Sergei Lvovich; and Kashina, Valentina Fedorovna, 4,061,633, Cl. 544-106.000.

Kashmer, James C.; and Tobin, Charles R., to Air Products and Chemicals, Inc. Control valve. 4,061,160, Cl. 137-637.200.

Kasson, James M.; and Wood, Samuel F., to Rolm Corporation. Key telephone adapter for electronic telephone switching system. 4,061,887, Cl. 179-99.000.

Kasyanov, Grigory Ivanovich: *See*—
Andoniev, Sergei Mikhailovich; Granovsky, Boris Ruvimovich; Golod, Leonid Davydovich; Kudinov, Gennady Alexandrovich; Kasyanov, Grigory Ivanovich; Filipiev, Oleg Vladimirovich; Tseluiko, Jury Ivanovich; and Lysenko, Evgeny Eliseevich, 4,061,317, Cl. 266-193.000.

Katagiri, Yoshio, to Kabushiki Kaisha Daini Seikosha. Color filter. 4,061,417, Cl. 350-159.000.

Kataoka, Mutsuo: *See*—
Ohno, Masaji; and Kataoka, Mutsuo, 4,061,769, Cl. 424-283.000.

Kato, Fumiaki: *See*—
Iizuka, Haruhiko; Matsumoto, Junichiro; and Kato, Fumiaki, 4,061,055, Cl. 74-866.000.

Kato, Shinji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil seal for rotary engine. 4,061,447, Cl. 418-142.000.

Kato, Shogo: *See*—
Kitai, Kiyoshi; Nakamura, Yukio; Kato, Shogo; and Nagaoka, Shinji, 4,062,029, Cl. 354-232.000.

Katoh, Kazumasa: *See*—
Saida, Yoshinori; and Katoh, Kazumasa, 4,061,116, Cl. 123-117.00D.

Katsuragawa, Kanzi; Hattori, Tatsuo; Kihara, Keiichi; and Tamabayashi, Hanzo, to Toyo Soda Manufacturing Co., Ltd. Process for producing ammonium p-styrenesulfonate. 4,061,669, Cl. 260-505.00N.

Kauffmann, J. H., to F & B Mfg. Co. Method and means for providing protective closures for high velocity applications. 4,061,139, Cl. 228-107.000.

Kaufhold, Manfred; and Wulf, Horst-Dieter, to Chemische Werke Huls Aktiengesellschaft. Oxo process with recovery of cobalt hydrocarbonyl in solution for recycle. 4,061,687, Cl. 260-632.0HF.

Kautz, Walter C., Jr. Engine pre-oiler. 4,061,204, Cl. 184-6.300.

Kawamoto, Tamio: *See*—
Toyota, Hiroshi; Nagatome, Kenji; and Kawamoto, Tamio, 4,061,217, Cl. 192-.052.

Kawamura, Mashaharu: *See*—
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Mashaharu; and Shinoda, Nobuhiko, 4,062,022, Cl. 354-38.000.

Kawanami, Shunpei; and Hanamoto, Yukimitsu, to Daiichi Koshuha Kogyo Kabushiki Kaisha. Method and apparatus for continuous bending of elongated materials. 4,061,005, Cl. 72-30.000.

Kawanobe, Kouhei: *See*—
Natori, Minoru; Hatuse, Toshikazu; Kawanobe, Kouhei; Ogawa, Hiroshi; Sekiya, Fukuo; Ebihara, Heihachiro; and Uchino, Misao, 4,060,974, Cl. 58-23.00R.

Kawaoka, Yutaka; Kifune, Tatsuo; Teshima, Masahiko; and Koizumi, Tatsuya, to Sanshin Kagaku Kogyo Company, Limited. Process for purification of crude 2-mercaptobenzothiazole. 4,061,646, Cl. 260-306.000.

Kawasaki Steel Corporation: *See*—
Hamada, Motoharu; and Harada, Shunichi, 4,061,801, Cl. 427-192.000.

Kawashima, Kazumi, to Matsushita Electric Industrial Co., Ltd. Channel selection apparatus provided with memory for digitalizing and storing channel selection voltage. 4,061,982, Cl. 325-464.000.

Kayanuma, Kanji, to Victor Company of Japan, Limited. Pulse generating device for regulating the rotational speed of a body. 4,061,950, Cl. 318-314.000.

Keck, John G.: *See*—
Alexander, Robert W.; and Keck, John G., 4,061,553, Cl. 204-114.000.

Keegan, William P. Pipettes. 4,061,037, Cl. 73-425.600.

Keene, Derek K.; and Hinde, Walter R., to Eaton Corporation. Vehicle service brake pedal. 4,061,053, Cl. 74-512.000.

Keller, Dale L., to Sheppard, Richard H. Undercutter attachment. 4,061,059, Cl. 82-1.00C.

Keller, Gerbert O. Multi-purpose tool. 4,060,902, Cl. 33-114.000.

Keller, Roman, to Siemens Aktiengesellschaft. Gasket for the high-frequency-tight connection of detachable metallic shielding elements. 4,061,413, Cl. 339-95.00R.

Keller, V. J.; and Taylor, William T. Combination wire line releasable overshot and pull tool. 4,061,389, Cl. 294-86.300.

Kendall Company, The: *See*—
Rappleyea, Frederick A., 4,060,855, Cl. 2-413.000.

Kennedy, Richard W.; and Tefft, Edward G., to General Electric Company. Producing glass passivated gold diffused rectifier pellets. 4,061,510, Cl. 148-187.000.

Kennelly, Jerauld M.: *See*—
Bast, Kenneth D.; and Kennelly, Jerauld M., 4,061,408, Cl. 339-75.00R.

KeNova AB: *See*—
Nilson, Billy N., 4,061,254, Cl. 222-494.000.

Kerb, Ulrich: *See*—
Wiechert, Rudolf; Kerb, Ulrich; and Engelfried, Otto, 4,061,661, Cl. 260-397.450.

Kerr, George T.; and Rollmann, Louis D., to Mobil Oil Corporation. Directed crystallization of synthetic aluminosilicates. 4,061,717, Cl. 423-329.000.

Kessler, Heinrich Hubert, to Siemens Aktiengesellschaft. Circuit arrangement for the protection of inputs of integrated MOS circuits. 4,061,928, Cl. 307-200.00B.

Kessler, Milton. Method of making a plastic container. 4,061,702, Cl. 264-24.000.

Kewannee Industries: *See*—
Lada, Arnold; Petrocci, Alfonso N.; Green, Harold A.; and Merianos, John J., 4,061,750, Cl. 424-249.000.

Keystone Products, Inc.: *See*—
D'Angelo, Robert A., 4,061,400, Cl. 301-37.0AT.

Khalifa, Ramzi A.: *See*—
Prather, Joseph E.; and Khalifa, Ramzi A., 4,061,371, Cl. 292-198.000.

Khasin, Kim Moiseevich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.

Khomenko, Vladimir Ivanovich: *See*—
Lifshits, Viktor Senderovich; Petrov, Georgy Nikolaevich; Papkov, Oleg Sergeevich; Khomenko, Vladimir Ivanovich; Gerasimenko, Alexandr Yakovlevich; Taradaiko, Alexandr Korneevich; Zemchenko, Alexandr Mikhailovich; and Gremyakov, Ivan Petrovich, 4,061,078, Cl. 90-24.00C.

Khoury, Nick S., to Continental Group, Inc., The. End closure with variable size pour opening. 4,061,243, Cl. 220-269.000.

Kifune, Tatsuo: *See*—
Kawaoka, Yutaka; Kifune, Tatsuo; Teshima, Masahiko; and Koizumi, Tatsuya, 4,061,646, Cl. 260-306.000.

Kihara, Keiichi: *See*—
Katsuragawa, Kanzi; Hattori, Tatsuo; Kihara, Keiichi; and Tamabayashi, Hanzo, 4,061,669, Cl. 260-505.00N.

Kijima, Shizumasa; Yamatsu, Isao; Minami, Norio; and Inai, Yuichi, to Eisai Co., Ltd. Process for synthesis of coenzyme Q compounds. 4,061,660, Cl. 260-396.00R.

Kikkoman Shoyu Co., Ltd.: *See*—
Yoshida, Fumihiko; Mizusawa, Kiyoshi; and Nakamura, Kazuo, 4,061,540, Cl. 195-62.000.

Kikumoto, Ryoji; Tobe, Akihiro; and Ikoma, Hidenobu, to Mitsubishi Chemical Industries Ltd. Pharmaceutically active 2-omega-aminoalkoxydiphenyl ethers. 4,061,776, Cl. 424-330.000.

Kilty, Peter A.: *See*—
Nielsen, Robert P.; and Kilty, Peter A., 4,061,659, Cl. 260-348.340.

Kimbrough, Wade L. Control system for high pressure hydraulic system. 4,061,271, Cl. 239-1.000.

Kimura, Rokusaburo; and Horii, Sadashige, to Matsushita Electric Works, Ltd. Digital clock. 4,060,972, Cl. 58-16.00D.

Kindgren, Lee; and Swanson, James P., to W. A. Whitney Corporation. Apparatus for forming holes in the flanges of structural members. 4,061,064, Cl. 83-368.000.

King, Gerard J.; and Martino, Joseph F., Jr., to United States of America, Army. Silicon-insulator-polysilicon infrared imaging device and method of making same. 4,061,916, Cl. 250-332.000.

King Instrument Corporation: *See*—
King, James L., Sr.; King, James L., Jr.; and Cline, William E., 4,061,286, Cl. 242-56.00R.

King, James L., Jr.: *See*—
King, James L., Sr.; King, James L., Jr.; and Cline, William E., 4,061,286, Cl. 242-56.00R.

King, James L., Sr.; King, James L., Jr.; and Cline, William E., to King Instrument Corporation. Automatic cassette loader. 4,061,286, Cl. 242-56.00R.

King, Roy J., Jr.: *See*—
Bean, Charles P.; King, Roy J., Jr.; and Uzgiris, Egidijus E., 4,061,543, Cl. 195-103.50K.

Kingman, Stephen A.; and Weaver, Leslie A., to LeBoeuf, Eugene A. Transport lock for lift bed trailer. 4,061,353, Cl. 280-106.00T.

Kirchmayr, Rudolf; and Illy, Hugo, to Ciba-Geigy Corporation. Flameproofing of plastics. 4,061,604, Cl. 260-2.5AJ.

Kistler Instrumente AG: *See*—
Witzke, Gunther; and Baumgartner, Hans Ulrich, 4,061,035, Cl. 73-406.000.

Kitai, Kiyoshi; Nakamura, Yukio; Kato, Shogo; and Nagaoka, Shinji, to Seiko Koki Kabushiki Kaisha. Lens shutter actuating device for quick-return type single-lens reflex camera. 4,062,029, Cl. 354-232.000.

Kitamura, Kazuhiko, to Aisin Seiki Kabushiki Kaisha. Pressure and temperature responsive valve assembly. 4,061,265, Cl. 236-48.00R.

Kitamura, Shigeki: *See*—
Hashimoto, Kiyoshi; and Kitamura, Shigeki, 4,061,938, Cl. 310-168.000.

Kitamura, Tatsuzo; and Inaba, Haruji, to Mitsui Mining & Smelting Co., Ltd. Electrolytic cell and circulating method for electrolyte. 4,061,559, Cl. 204-106.000.

Kitamura, Tomosaburo, to Sony Corporation. Integrally sintered ceramic complex and method of manufacturing the same. 4,061,816, Cl. 428-218.000.

Kitao, Akihiro: *See*—
Murata, Michihiro; and Kitao, Akihiro, 4,061,583, Cl. 252-62.3BT.

Kitazawa Shoji Kabushiki Kaisha: *See*—
Yoshiike, Kiwamu; and Yazaki, Hitoshi, 4,061,307, Cl. 251-315.000.

Kitchen, John P.; and Riddle, Neville L., to Hoover Ball and Bearing Company. Box spring assembly having serpentine right angle bend springs therein. 4,060,862, Cl. 5-260.000.

Kiyonaga, Kazuo, to Union Carbide Corporation. Process for producing glass in a rotary furnace. 4,061,487, Cl. 65-135.000.

Kiyota, Yuhiko, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Carburetor system for multicylinder engine. 4,061,118, Cl. 123-119.0LR.

Klassen, Horst Willi: *See*—
Gee, David William; Klassen, Horst Willi; and Rath, Heinrich Bernard, 4,061,209, Cl. 188-73.300.

Klaus, Michael Josef; and Pawson, Beverly Ann, to Hoffmann-La Roche Inc. Polyene compounds. 4,061,656, Cl. 260-332.20A.

Kleinerman, Marcos. Infrared detection and imaging, method and apparatus. 4,061,578, Cl. 250-330.000.

Klisch, Stephen Cajetan; and Martin, Charles Andrew, to Colgate-Palmolive Company. Olefin sulfonate detergent compositions. 4,061,586, Cl. 252-153.000.

KMS Fusion, Inc.: *See*—
Siebert, Larry D., 4,061,985, Cl. 331-94.50C.

Knofel, Hartmut; and Ellendt, Gunther, to Bayer Aktiengesellschaft. Process for the preparation of aromatic polyamines. 4,061,678, Cl. 260-570.00D.

Knott, Philip H. Toy dump truck having closed container of granular material. 4,060,931, Cl. 46-112.000.

Kobayashi, Kazuhiro: *See*—
Miura, Yoshio; Kobayashi, Kazuhiro; and Kotera, Masao, 4,061,289, Cl. 242-7.130.

Kobayashi, Makio: *See*—
Senjo, Teizo; and Kobayashi, Makio, 4,061,743, Cl. 423-235.000.

Kobayashi, Takashi: *See*—
Kubota, Hitoshi; and Kobayashi, Takashi, 4,061,964, Cl. 324-28.0SE.

Kobayashi, Yoshinari; Matuo, Ryukichi; and Nishiyama, Masashi, to Agency of Industrial Science & Technology. Method for adsorption of oils. 4,061,567, Cl. 210-40.000.

Kober, Hubert Reinhard, to Fixatorenbau Bertuch & Co. GmbH. Centrally anchored aligning device for machines. 4,061,298, Cl. 248-23.000.

Kobori, Toshio; Tsujimoto, Kayoshi; Nanba, Yasuhiro; and Yamada, Seiji, to Minolta Camera Kabushiki Kaisha. Exposure control devices for photographic cameras. 4,062,023, Cl. 354-38.000.

Kochhar, Rajindar K.: *See*—
Hughes, Richard H.; Jamieson, Donald R.; and Kochhar, Rajindar K., 4,061,847, Cl. 526-49.000.

Kockums Industri Aktiebolag: *See*—
Arnoldsson, Eric, 4,061,052, Cl. 74-498.000.

Kodama, Hachio: *See*—
Ozaki, Hiromi; Yamane, Mamoru; Kodama, Hachio; and Yoshika, Haruo, 4,061,472, Cl. 44-1.00R.

Koenig, Robert B.: *See*—
Carnahan, Joe B.; and Koenig, Robert B., 4,061,380, Cl. 339-8.00R.

Koerner, Heinz-Hermann: *See*—
Stastny, Fritz; Gaeth, Rudolf; Haardt, Udo; and Koerner, Heinz-Hermann, 4,061,701, Cl. 264-51.000.

Koester, Eberhard: *See*—
Ohlinger, Manfred; Schoenafinger, Eduard; Vaeth, Guenter; Stritzinger, Heinz; Koester, Eberhard; Schneehage, Hans Henning; and Steck, Werner, 4,061,726, Cl. 423-634.000.

Kohler, Werner, to Daimler-Benz Aktiengesellschaft. Warning device for indicating critical condition of starter batteries in vehicles. 4,061,839, Cl. 429-93.000.

Koizumi, Tatsuya: *See*—
Kawaoka, Yutaka; Kifune, Tatsuo; Teshima, Masahiko; and Koizumi, Tatsuya, 4,061,646, Cl. 260-306.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Yokoi, Hiroshi; and Akagawa, Masataka, 4,062,018, Cl. 343-754.000.

Kokusai Electric Co., Ltd.: *See*—
Mizushina, Youichi, 4,061,870, Cl. 13-24.000.
Komatsu, Toshiaki: *See*—
Yamada, Hirotada; Okamura, Kosaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,061,748, Cl. 424-246.000.
Kondo, Takajiro; Asamoto, Toshitaka; and Oki, Tsutomu, to Hitachi Metals, Ltd. Cutter for semicylindrically curled paper. 4,060,892, Cl. 30-253.000.
Konig, Franz, to Fr. Ernst Fehrer Gesellschaft m. b. H. & Co., K.G. Textilmaschinenfabrik und Stahlbau. Apparatus for spinning textile fibers. 4,060,966, Cl. 57-58.890.
Koninklijke Emballage Industrie Van Leer B.V.: *See*—
Tasseron, Frans A. W., 4,061,239, Cl. 215-221.000.
Konishi, Masami; and Futamura, Kazumasa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purifier for an internal combustion engine. 4,060,982, Cl. 60-282.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Amano, Tadashi; and Nakamura, Masaji, 4,061,428, Cl. 356-175.000.
Kopp, Jean Ernest. Variable speed drive mechanism. 4,061,045, Cl. 74-198.000.
Koppers Company, Inc.: *See*—
van Ackeren, Joseph; and Helm, Edward J., 4,061,544, Cl. 202-141.000.
Korger, Heinz, to Hannes Marker. Ski brake. 4,061,355, Cl. 280-605.000.
Korinth, Jurgen: *See*—
Feser, Manfred; Joerchel, Egon; and Korinth, Jurgen, 4,061,723, Cl. 423-276.000.
Kormany, Geza; Kabas, Guglielmo; Schlapfer, Hans; and Siegrist, Adolf Emil, to Ciba-Geigy Corporation. Stilbene compounds. 4,061,860, Cl. 542-462.000.
Kostrzewa, Michael: *See*—
Holst, Arno; and Kostrzewa, Michael, 4,061,692, Cl. 260-874.000.
Kotera, Masao: *See*—
Miura, Yoshio; Kobayashi, Kazuhiro; and Kotera, Masao, 4,061,289, Cl. 242-7.130.
Kotezawa, Katsutaka; Onodera, Toshimi; Hayashi, Setsuo; and Shimanuki, Fujio, to Chiba Communications Industries, Inc. Simultaneous telecommunication between radio stations. 4,062,016, Cl. 343-178.000.
Kouvarellis, Georgeos Konstandenos: *See*—
Washburn, Owen Victor; Kouvarellis, Georgeos Konstandenos; and Ferguson, William Alexander, 4,061,565, Cl. 210-32.000.
Krakow, Heinz: *See*—
Bartels, Werner; and Krakow, Heinz, 4,061,264, Cl. 228-145.000.
Krasin, Thomas L., to Audio Visual Innovators Corporation. Automatically switched spare lamp for a light projector. 4,061,911, Cl. 362-20.000.
Krenzer, John, to Velsicol Chemical Corporation. Certain 5-acyloxy-1-thiadiazolyl-2-oxoimidazolidine compounds. 4,061,648, Cl. 260-/306.80D.
Kruse, Friedel: *See*—
Bantien, Jurgen; Bardenhagen, Dietrich; Mielke, Johannes; and Kruse, Friedel, 4,061,234, Cl. 214-6.00M.
Kubek, Andrew, Sr.: *See*—
Kubek, John, 4,061,296, Cl. 244-112.000.
Kubek, John, to Kubek, Andrew, Sr., a part interest. Braking system for ski or float equipped aircraft. 4,061,296, Cl. 244-112.000.
Kubik, Peter Steve, to Bell Telephone Laboratories, Incorporated. Circuit board terminal identification device. 4,061,410, Cl. 339-113.00B.
Kubo, Taketoshi: *See*—
Yoshida, Akira; Kubo, Taketoshi; Yamajo, Mashayuki; and Ishigaki, Masahiro, 4,061,172, Cl. 152-379.100.
Kubota, Hitoshi; and Kobayashi, Takashi, to Hitachi, Ltd. Armature operation-release testing apparatus. 4,061,964, Cl. 324-28.0SE.
Kuc, Anthony: *See*—
Kuc, John; and Kuc, Anthony, 4,061,013, Cl. 72-354.000.
Kuc, John; and Kuc, Anthony. Method of forming socket wrenches. 4,061,013, Cl. 72-354.000.
Kudinov, Gennady Alexandrovich: *See*—
Andoniev, Sergei Mikhailovich; Granovsky, Boris Ruvimovich; Golod, Leonid Davydovich; Kudinov, Gennady Alexandrovich; Kasyanov, Grigory Ivanovich; Filipiev, Oleg Vladimirovich; Tseluiko, Jury Ivanovich; and Lysenko, Evgeny Eliseevich, 4,061,317, Cl. 266-193.000.
Kuenzi, Ernst: *See*—
Dubied, Gilbert; and Kuenzi, Ernst, 4,060,939, Cl. 51-157.000.
Kuhfus, Gerd: *See*—
Gumb, Beverley William; Kuhfus, Gerd; and Cogan, Fredrick Thomas, 4,061,411, Cl. 339-159.00R.
Kunkle, John Philip, to AMP Incorporated. High current carrying connector. 4,061,406, Cl. 339-47.00C.
Kuno, Akira; and Shinoda, Yoshio, to Nippon Soken, Inc. Fuel-meter-combined fuel consumption rate meter. 4,061,023, Cl. 73-114.000.
Kunstmann, Rudolf: *See*—
Bartmann, Wilhelm; Kunstmann, Rudolf; Lerch, Ulrich; and Scholkens, Bernward, 4,061,766, Cl. 424-279.000.
Beck, Gerhard; Kunstmann, Rudolf; Babej, Milos; and Teufel, Hermann, 4,061,671, Cl. 260-514.00D.
Kunzle, Franz Martin, to Sandoz Ltd. 6-Piperazino-11-methylene-dibenzazepines[b,e]. 4,061,752, Cl. 424-250.000.
Kuramoto, Kazuo: *See*—
Nagano, Toshio; and Kuramoto, Kazuo, 4,061,365, Cl. 280-745.000.
Kuroda, Nobukazu, to Sony Corporation. High permeability, long wearing magnetic head alloy. 4,061,509, Cl. 148-31.550.
Kuroda, Nobuyuki; Shiraishi, Takeichi; Itoh, Akio; Matsuura, Kazuo; and Miyoshi, Mituji, to Nippon Oil Company Ltd. Process for preparing polyolefins. 4,061,857, Cl. 526-114.000.
Kuroiwa, Kazuya: *See*—
Yokokawa, Takao; Kanazawa, Shogo; Otoguro, Yasuo; Suzuki, Nobukazu; Akase, Sigeyuki; Miida, Noboru; Akazawa, Tadahisa; and Kuroiwa, Kazuya, 4,061,494, Cl. 75-124.000.
Kurosaki, Mutsuo, to Nifco Inc. Cord clamp. 4,061,299, Cl. 248-73.000.
Kurumada, Tomoyuki: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,061,616, Cl. 260-45.80N.
Kvaerna, Sverre; and Barud, Sigvard, to Siemens Aktiengesellschaft. Patients support table. 4,061,324, Cl. 269-325.000.
L. B. Foster Company: *See*—
Herz, Alvin E., 4,061,196, Cl. 173-49.000.
L. F. Lang & Son Pools, Inc.: *See*—
Lang, Robert S.; Post, Rodney Morris; and Hogan, Thomas Leo, 4,060,946, Cl. 52-169.700.
Laakso, Oliver A.; and Sherman, Michael I., to Kamyr, Inc. Method and apparatus for digesting cellulose material without screening digesting liquid withdrawn through the digester top. 4,061,193, Cl. 162-19.000.
Laboratoire Suisse de Recherches Horlogeres: *See*—
Dubied, Gilbert; and Kuenzi, Ernst, 4,060,939, Cl. 51-157.000.
Lachnit, Wolfgang, to Berglein, Adolf. Machine for mechanical production of brick masonry. 4,060,955, Cl. 52-749.000.
Lacroix, Roger; and Lepere, Claude, to Sea Tank Co. S.A. Immersion of an offshore weight-structure having two compartments. 4,060,995, Cl. 61-92.000.
Lada, Arnold; Petrocci, Alfonso N.; Green, Harold A.; and Merianos, John J., to Kewannee Industries. Antimicrobial composition. 4,061,750, Cl. 424-249.000.
Lahm, Heinrich; and Gutbrod, Dieter, to Index-Werke KG Hahn & Tessky. Automatic turret lathe. 4,061,061, Cl. 82-2.500.
Lai Chen, Sow-Mei: *See*—
Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; Grudzinskas, Charles Vincent; and Lai Chen, Sow-Mei, 4,061,670, Cl. 260-514.00D.
Lake, Anthony William; and Rose, Carl John, to Beecham Group Limited. Naphthalene derivatives having anti-inflammatory activity. 4,061,779, Cl. 424-331.000.
Lamb, Joe H. Braking system for motorized swimming pool covers. 4,060,860, Cl. 4-172.140.
Lamparter, Hansruedi, to Rieter Machine Works, Ltd. Apparatus for re-transferring power from mechanically driven and/or electrically braked motors of spinning machines. 4,061,948, Cl. 318-87.000.
Lane, Robert L.: *See*—
Sachuk, Daniel B.; and Lane, Robert L., 4,061,329, Cl. 271-10.000.
Lang, Hans-Jochen; and Muschaweck, Roman, to Hoechst Aktiengesellschaft. Thiazolidine derivatives. 4,061,647, Cl. 260-306.70T.
Lang, Hans-Jochen; and Muschaweck, Roman, to Hoechst Aktiengesellschaft. Thiazolidine derivatives. 4,061,761, Cl. 424-270.000.
Lang, Richard A. Pedal-actuated bicycle gear shift means. 4,061,046, Cl. 74-217.00B.
Lang, Robert S.; Post, Rodney Morris; and Hogan, Thomas Leo, to L. F. Lang & Son Pools, Inc. In-ground swimming pool construction. 4,060,946, Cl. 52-169.700.
Langdon, William Keith: *See*—
Helfert, Herbert; Langdon, William Keith; and Davis, Pauls, 4,061,684, Cl. 260-615.00B.
Lange, Hans; Rittersdorf, Walter; Rey, Hans-Georg; Werner, Wolfgang; and Rieckmann, Peter, to Boehringer Mannheim GmbH. Stable test strips having a water-soluble paper layer and methods for making same. 4,061,468, Cl. 23-253.0TP.
Langlie, Howard: *See*—
Berg, Albert T., Jr.; and Langlie, Howard, 4,061,873, Cl. 174-208.000.
Lantz, Charles Hunter, to B. F. Goodrich Company, The. Brake pressure control valve. 4,061,404, Cl. 303-118.000.
La Porta, Guido A.: *See*—
Jacoby, Marvin; and La Porta, Guido A., 4,061,924, Cl. 250-476.000.
Laptewicz, Joseph E., Jr.: *See*—
Finn, Robert K.; Tannahill, Alex L.; and Laptewicz, Joseph E., Jr., 4,061,585, Cl. 252-89.00R.
Larson, Robert W. Flail delimber. 4,061,166, Cl. 144-2.00Z.
Last, Anthony J., to Ewald, John S. Ultraviolet sensing device. 4,061,922, Cl. 250-461.00R.
Last, Werner, to Toosbuy, Karl-Heinz Werner. Chassis for a vehicle capable of travelling over obstructions. 4,061,199, Cl. 180-8.00A.
Latash, Jury Vadimovich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.
Lauz, Peter: *See*—
Kahr, Kurt; Pohl, Hanns; Rapp, Guenther; and Lauz, Peter, 4,061,677, Cl. 260-566.00A.

Laver, Myron B.: *See—*
Morris, Kent C.; Bonsen, Pieter; and Laver, Myron B., 4,061,736, Cl. 424-177.000.

LaVoie, Raymond V.: *See—*
Frye, Burton L.; Pittman, Max G.; Runge, David A.; Souza, Lawrence C.; and LaVoie, Raymond V., 4,061,480, Cl. 55-356.000.

Lawrence, Anne M.: *See—*
Lawrence, Dennis G.; and Lawrence, Anne M., 4,060,861, Cl. 4-253.000.

Lawrence, Dennis G.; and Lawrence, Anne M. Protective device for a toilet lid. 4,060,861, Cl. 4-253.000.

Lawrence, John B.: *See—*
Campbell, Roy E.; Lawrence, John B.; and Tonne, Ronald Ray, 4,061,481, Cl. 62-29.000.

Lazarus, Stanley David; and Newland, Julian Harold, to Allied Chemical Corporation. Stabilized polyamides. 4,061,708, Cl. 264-211.000.

Lebedev, Vladimir Mikhailovich: *See—*
Bart, Evgeny Vasilievich; Batalin, Oleg Efimovich; Troitsky, Andrian Petrovich; Skachkova, Nina Andreevna; Lebedev, Vladimir Mikhailovich; and Trifonova, Rimma Petrovna, 4,061,680, Cl. 260-606.000.

Le Blanc, Mervin G. Jig for electrical conduit stubs. 4,061,322, Cl. 269-43.000.

LeBoeuf, Eugene A.: *See—*
Kingman, Stephen A.; and Weaver, Leslie A., 4,061,353, Cl. 280-106.00T.

Lecloux, Andre: *See—*
Weidenbach, Guenter; Lecloux, Andre; and Gobillon, Yves, 4,061,713, Cl. 423-213.500.

Lee, Chin Kee, to R. J. Reynolds Tobacco Company. Preparation and use of glucose isomerase. 4,061,539, Cl. 195-31.00F.

Leesona Corporation: *See—*
Walker, William J.; and Boulay, Henri A., 4,061,282, Cl. 241-222.000.

Legille, Edouard, to S.A. des Anciens Etablissements Paul Wurth. Device for the extraction of gaseous samples and for thermal measurement above the burden of a shaft furnace. 4,061,036, Cl. 73-421.50A.

Lehmann, William F.: *See—*
Geimer, Robert L.; and Lehmann, William F., 4,061,813, Cl. 428-183.000.

Lekarski, Simeon: *See—*
Gachot, Jean; and Lekarski, Simeon, 4,061,156, Cl. 137-109.000.

Leleu, Gerard; Bedague, Pierre; and Sillion, Bernard, to Institut Francais du Petrole; and Rhone Progil. Trimethylolpropane esters useful as base lubricants for motor oils. 4,061,581, Cl. 252-32.70E.

Lennox Industries, Inc.: *See—*
Dirk, William R.; and Parker, Sidney A., 4,061,444, Cl. 417-312.000.

Leonard, Ronald J., to Baxter Travenol Laboratories, Inc. Blood oxygenator utilizing a removable membrane oxygenator unit. 4,061,470, Cl. 23-258.50M.

Lepere, Claude: *See—*
Lacroix, Roger; and Lepere, Claude, 4,060,995, Cl. 61-92.000.

Lerch, Ulrich: *See—*
Bartmann, Wilhelm; Kunstmann, Rudolf; Lerch, Ulrich; and Scholkens, Bernward, 4,061,766, Cl. 424-279.000.

Lerner, David S.: *See—*
Freed, Gerald Lewis; and Lerner, David S., 4,062,005, Cl. 340-198.000.

Lerner, Henry C. Wire stripper. 4,060,891, Cl. 30-90.100.

Lerner, Stanley; and Shearer, Robert, to Color Communications, Inc. Method and apparatus for manufacture of swatch bearing sheets. 4,061,521, Cl. 156-265.000.

Leslie Hartridge Limited: *See—*
Emerson, Reginald Stanley, 4,061,027, Cl. 73-119.00 R.

Le Sota, Stanley: *See—*
Brodnyan, John G.; Holloway, Donald F.; and Le Sota, Stanley, 4,061,822, Cl. 428-315.000.

Leto, Armetia E.; and Bauer, Lawrence H. Doll with internal warming mechanism. 4,060,932, Cl. 46-116.000.

Leuchter, Jurgen, to AGFA-Gevaert Aktiengesellschaft. Apparatus for removing liquids from moving strips of photographic material or the like. 4,060,873, Cl. 15-256.500.

Levasseur, Craig, to Berkey-Colortran, Inc. Filament alignment mechanism for follow spot or the like. 4,061,912, Cl. 362-287.000.

Levijoki, Wayne A.: *See—*
Peterson, Philip R.; Taylor, David W.; and Levijoki, Wayne A., 4,061,402, Cl. 303-92.000.

Levine, Marshall S.; and Faulkner, Albert A., to SmithKline Corporation. Slide smearing device. 4,061,108, Cl. 118-100.000.

Levine, Seymour D.: *See—*
Kanojia, Ramesh M.; and Levine, Seymour D., 4,061,739, Cl. 424-195.000.

Lewandowski, Raymond F., to Oak Industries Inc. Hall effect linear motion switch. 4,061,988, Cl. 338-32.00H.

Lewis, Michael Roland. Drive mechanism for reclining chairs. 4,061,397, Cl. 297-330.000.

Lewis, William Dein: *See—*
Cohen, Lester Samuel; and Lewis, William Dein, 4,061,572, Cl. 210-168.000.

Ley, Ralph M., Jr.; Alyea, Harold W.; and Holloway, Thomas M., to Johnson Controls, Inc. Environmental air distribution control system powered by system pressure. 4,061,266, Cl. 236-49.000.

Leybold-Heraeus GmbH & Co. KG: *See—*
Sommerkamp, Peter; and Heil, Walter, 4,061,871, Cl. 13-31.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Baumgartel, Karl Heinz; Altenburg, Dieter; and Hase, Siegfried, 4,061,332, Cl. 271-270.000.

Liebetrau, Richard E.: *See—*
Miller, Larry J.; Miller, Marion V.; and Liebetrau, Richard E., 4,060,935, Cl. 49-25.000.

Lien, Eric L.: *See—*
Alburn, Harvey E.; Lien, Eric L.; and Grant, Norman H., 4,061,737, Cl. 424-177.000.

Lifetime Carbide Company: *See—*
Gray, Gorman D., 4,061,057, Cl. 76-112.000.

Lifshits, Viktor Senderovich; Petrov, Georgy Nikolaevich; Papkov, Oleg Sergeevich; Khomenko, Vladimir Ivanovich; Gerasimenko, Alexandr Yakovlevich; Taradaiko, Alexandr Korneevich; Zemchenko, Alexandr Mikhailovich; and Gremyakov, Ivan Petrovich. Device for removing external circular fins from pipe joints. 4,061,078, Cl. 90-24.00C.

Light, Stanley. Gauge for mounting window-shade brackets. 4,060,905, Cl. 33-180.00R.

Lillis, Rupert Martin: *See—*
Duffield, Peter Roe; Flockton, Peter Robin; Lillis, Rupert Martin; Turner, Brian Maurice; and Crowell, Donald Edward, 4,061,706, Cl. 264-90.000.

Lilly Industries, Limited: *See—*
Chakrabarti, Jiban Kumar; Hotten, Terrence Michael; and Tupper, David Edward, 4,061,774, Cl. 424-325.000.

Lin, Chiu-Hong, to Upjohn Company, The. 5,6-Didehydro-ω-phenoxy-PGE_2-analogs. 4,061,665, Cl. 260-410.90R.

Lin, Chiu-Hong, to Upjohn Company, The. 5,6-Didehydro-ω-aryl-11-deoxy-PGE_2 analogs. 4,061,666, Cl. 560-53.000.

Lincoln, Launa J. Geographic board game. 4,061,336, Cl. 273-134.0AC.

Lindbergh, Jon M., to Union Carbide Corporation. Net-raising tool. 4,061,387, Cl. 294-26.000.

Lindler, James Monroe; and Romanyszyn, Michael Taras, Jr., to Shakespeare Company. Flexible hollow fishing rod. 4,061,806, Cl. 428-35.000.

Lindmark, Nils Roger: *See—*
Sjoholm, Ingvar Gosta Holger; Lindmark, Nils Roger; and Ekman, Bo Magnus, 4,061,466, Cl. 23-230.00B.

Lindsley, John Francis: *See—*
Goldstein, Marvin Sherwood; Lindsley, John Francis; Allison, William Woodrow; and Price, Charles Dan, 4,061,597, Cl. 252-465.000.

Line, Larry L.: *See—*
George, Jay R.; Line, Larry L.; and Reed, David H., 4,061,516, Cl. 156-94.000.

Linehan, Kevin Lawrence: *See—*
Graham, Clifford Arthur Andrew; and Linehan, Kevin Lawrence, 4,061,728, Cl. 424-14.000.

Lingl Corporation: *See—*
Lingl, Hans, 4,061,528, Cl. 156-561.000.

Lingl, Hans, to Lingl Corporation. Apparatus for the manufacture of prefabricated lined wall sections. 4,061,528, Cl. 156-561.000.

Link, Gustav A. Timing system for watering devices. 4,061,927, Cl. 307-41.000.

Litva, John; and Stevens, Everett Earle. Rapid azimuthal determination of radio signals. 4,062,015, Cl. 343-120.000.

Liuzza, James J. Bar chair for reinforcing rods. 4,060,954, Cl. 52-677.000.

Livingston, Harry E.: *See—*
Marks, Arnold, 4,061,170, Cl. 150-52.00R.

Ljubimova, Nina Andreevna: *See—*
Ivanova, Raisa Vasilievna; Belsky, Arkady Andreevich; Novikov, Nikolai Alexandrovich; Alexeeva, Nina Nikolaevna; Nikitina, Ljudmila Nikolaevna; Ljubimova, Nina Andreevna; and Dotsenko, Anna Evgenievna, 4,061,551, Cl. 204-105.00R.

Ljung, Ake, to AB Svenska Flaktfabriken. Combined cooling and heat recovery system. 4,061,186, Cl. 165-59.000.

Lloyd, Donald, to Tex-Tube Division of Detroit Steel Corporation. Apparatus for providing regulated direct current to magnetizing coils for non-destructive magnetic testing. 4,061,960, Cl. 323-9.000.

Lo, Kenneth K., to Raymond Lee Organization, Inc., The, a part interest. Balloon with manually operable helicopter blades. 4,061,293, Cl. 244-26.000.

Lobmeyer, Raymond Joseph: *See—*
Hilgert, Charles William; and Lobmeyer, Raymond Joseph, 4,061,576, Cl. 210-437.000.

Lockheed Electronics Co., Inc.: *See—*
Freed, Gerald Lewis; and Lerner, David S., 4,062,005, Cl. 340-198.000.

Lof, George O. G. Solar heating system and operation thereof. 4,061,267, Cl. 237-1.00A.

Lofquist, Robert Alden; and Haylock, John Christopher, to Allied Chemical Corporation. Production of polycaproamide fiber from polycaproamide reacted with cyclic tetracarboxylic acid dianhydride. 4,061,621, Cl. 260-78.00L.

Lohr-Construction de Vehicules Industriels S.A.: *See—*
Schall, Roger, 4,061,390, Cl. 296-1.00A.

Lorain Products Corporation: *See—*
Chambers, Charles W., Jr., 4,061,883, Cl. 179-16.00F.

Lorenz, Hellmut, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. False twisters. 4,060,967, Cl. 57-77.450.

Lotspeich, Joseph A., to Gross-Given Manufacturing Company. Helical coil dispensing machine apparatus. 4,061,245, Cl. 221-75.000.

Louisville Bedding Company: *See—*
Elsas, Norman E., 4,061,096, Cl. 112-121.140.

Love, Mahlon Lloyd: *See*—
Hengen, Edward John; and Love, Mahlon Lloyd, 4,060,960, Cl. 56-14.600.

Love, Richard F.; and Duranleau, Roger G., to Texaco Inc. Preparation of 3,5-disubstituted-4-nitroisoxazoles. 4,061,651, Cl. 260-307.00H.

Loveland, Winton: *See*—
Warshaw, Saul; Loveland, Winton; Hanemann, Horst J.; and Ramaglia, Michael, 4,061,526, Cl. 156-468.000.

Loveshaw Corporation, The: *See*—
Warshaw, Saul; Loveland, Winton; Hanemann, Horst J.; and Ramaglia, Michael, 4,061,526, Cl. 156-468.000.

Lowder, James E.; and Perry, Gary D., to Eagle-Picher Industries, Inc. Side tilt integrated cab. 4,061,392, Cl. 296-28.00C.

Lubrizol Corporation, The: *See*—
Jahnke, Richard William, 4,061,580, Cl. 252-8.55R.
Steckel, Thomas Frier, 4,061,474, Cl. 44-66.000.

Lugovsky, Vladimir Ivanovich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.

Lummus Company, The: *See*—
Sze, Morgan C., 4,061,471, Cl. 23-260.000.

Lund, Rolf, to Oy E. Sarlin AB. Seal for a rotating shaft. 4,061,345, Cl. 277-88.000.

Lunn, William H. W., to Eli Lilly and Company. 7-[α-(2,3-dihydro-2-oxo-1H-benzimidazol-1-ylcarbonyl-amino)arylacetamido]cephalosporins. 4,061,861, Cl. 544-30.000.

Lux, Peter: *See*—
Mollendorf, Ralf; and Lux, Peter, 4,061,920, Cl. 250-413.000.

Lynch, Thomas J.: *See*—
Goel, Rajeshwar P.; Vota, Terry L.; and Lynch, Thomas J., 4,061,937, Cl. 310-65.000.

Lysenko, Evgeny Eliseevich: *See*—
Andoniev, Sergei Mikhailovich; Granovsky, Boris Ruvimovich; Golod, Leonid Davydovich; Kudinov, Gennady Alexandrovich; Kasyanov, Grigory Ivanovich; Filipiev, Oleg Vladimirovich; Tseluiko, Jury Ivanovich; and Lysenko, Evgeny Eliseevich, 4,061,317, Cl. 266-193.000.

MacConnell, John W.: *See*—
United States of America, National Aeronautics and Space Administration; Sydnor, Richard L.; and MacConnell, John W., 4,061,974, Cl. 325-58.000.

Machinefabriek Mampaey Marine Engineering B. V.: *See*—
Mampaey, Johannes Josephus, 4,061,103, Cl. 114-252.000.

MacLeod, John Norman, to Tecumseh Products Company. Magneto-alternator with magneto energy limiting. 4,061,121, Cl. 123-149.00R.

MacMillan Bloedel Limited: *See*—
Barnes, Derek, 4,061,819, Cl. 428-294.000.

Madacsi, John P.: *See*—
Franklin, William E.; Madacsi, John P.; and Rowland, Stanley P., 4,061,465, Cl. 8-185.000.

Madaus, Rolf Hermann Heinrich; Halbach, Gunter; and Trost, Wilfried, to Dr. Madaus & Co. Polyhydroxyphenylchromanone salts and therapeutic composition. 4,061,765, Cl. 424-278.000.

Madsen, Hans Berg; Holst, Preben Lindholm; and Solli, Houk, to A/S Cheminova. Compounds having juvenile hormone activity. 4,061,757, Cl. 424-263.000.

Maeda, Toshiyuki: *See*—
Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, 4,061,446, Cl. 418-133.000.

Maehr, Hubert: *See*—
Demny, Thomas Casimir; and Maehr, Hubert, 4,061,542, Cl. 195-80.00R.

Magid, Robert P.; and Sly, Gerald, to Oxford Chemicals, Incorporated. Self-adhering material. 4,061,820, Cl. 428-311.000.

Magidoff, Barry G.: *See*—
Rosenfeld, Steven Allen, 4,061,910, Cl. 362-34.000.

Magne, Frank C.: *See*—
Mod, Robert R.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 4,061,634, Cl. 544-158.000.

Magneron, Jean, to E.L.A.P. Transmission system and repeater stations therefor. 4,061,970, Cl. 325-2.000.

Magnesium Elektron Limited: *See*—
Phillips, Raymond Francis, 4,061,720, Cl. 423-265.000.

Makar, Kamel Michel, to Du Pont de Nemours, E. I., and Company. Catalyst for hydrogenating anthraquinones. 4,061,598, Cl. 252-466.0PT.

Mampaey, Johannes Josephus, to Machinefabriek Mampaey Marine Engineering B. V. Towing hook. 4,061,103, Cl. 114-252.000.

Mandai, Akio: *See*—
Kanegae, Junji; Izumi, Tsugio; and Mandai, Akio, 4,061,798, Cl. 426-607.000.

Mandel, Albert. Longitudinally expandable shoe. 4,060,918, Cl. 36-97.000.

Mangei, Bernd: *See*—
Winkler, Bruno; Mangei, Bernd; and Fritz, Dieter, 4,061,786, Cl. 426-138.000.

Manghisi, Elso; Cascio, Giuseppe; and Fregnan, Giancarlo, to Istituto Luso Farmaco d'Italia S.r.l. Certain 4-aryl-5-(4-phenylpiperazino)alkyl-4-thiazolin-2-ones. 4,061,637, Cl. 260-268.0PH.

Mann, Elton W., to Hershey Foods Corporation. Plant treating mixtures and methods utilizing spores of *Bacillus uniflayellatus*. 4,061,488, Cl. 71-77.000.

Mannens, Marc Godfried: *See*—
Monbaliu, Marcel Jacob; Mannens, Marc Godfried; Van Poucke, Raphael Karel; Credner, Hans-Heinrich; and Meier, Ernst, 4,061,498, Cl. 96-100.00R.

Manufacturing Approaches & Total Concepts, Inc.: *See*—
Strange, Delbert D.; and Hunts, Ronald M., 4,061,437, Cl. 408-42.000.

Mar-Pha, Societe d'Etudeet d'Exploitation de Marques Mar-Pha: *See*—
Mardiguian, Jean, 4,061,777, Cl. 424-330.000.

Marans, Nelson Samuel; and Gluecksmann, Alfred, to W. R. Grace & Co. Removal of unreacted tolylene diisocyanate from urethane prepolymers. 4,061,662, Cl. 560-26.000.

Marcalus, Nicholas; and Smaw, Jesse B. Methods and apparatus for interfolding endless paper webs. 4,061,325, Cl. 270-40.000.

Marcantonio, Livio F.; and D'Haem, Marcel P., to Chicago Pneumatic Tool Company. Locomotive speed recorder system. 4,061,039, Cl. 73-489.000.

Marcus, Harris L.: *See*—
United States of America, National Aeronautics and Space Administration; Stocker, Phillip J.; and Marcus, Harris L., 4,061,427, Cl. 356-159.000.

Marcus, Paul. Injection blow molding process. 4,061,705, Cl. 264-89.000.

Mardiguian, Jean, to Mar-Pha, Societe d'Etudeet d'Exploitation de Marques Mar-Pha. Vasodilatory terpeno-phenoxyalkylamines. 4,061,777, Cl. 424-330.000.

Marforio, Nerino, to Rockwell-Rimoldi S.p.A. Unit for automatically sewing the opposite edges of piece of fabric. 4,061,097, Cl. 112-121.150.

Margotte, Dieter; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Flame-resistant polycarbonate molding compositions. 4,061,691, Cl. 260-860.000.

Marino, Joseph A.: *See*—
Batchelor, Phillip J.; Traister, Robert L.; Gray, Gary A.; and Marino, Joseph A., 4,062,061, Cl. 364-900.000.

Marjuschenko, Vilen Fedorovich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.

Marks, Alfred F., to Diamond Shamrock Corporation. Flowable, aqueous pesticide compositions of improved activity. 4,061,770, Cl. 424-304.000.

Marks, Arnold, to Marks, Arnold; Marks, Judith A.; and Livingston, Harry E. Glove conditioning container. 4,061,170, Cl. 150-52.00R.

Marks, Judith A.: *See*—
Marks, Arnold, 4,061,170, Cl. 150-52.00R.

Marks, Paul D.: *See*—
Marks, Ronald H.; Marks, Paul D.; and Goodman, Lawrence R., 4,060,999, Cl. 66-125.00A.

Marks, Ronald H.; Marks, Paul D.; and Goodman, Lawrence R., to Enterprise Incorporated. Method and apparatus for forming yarn elements and producing products therefrom. 4,060,999, Cl. 66-125.00A.

Marlin Firearms Company, The: *See*—
Burns, Arthur H., Jr., 4,061,006, Cl. 72-34.000.

Marlor, Guy Anthony. Composition for preparation of a photoconductor surface for use in electrophotography. 4,061,599, Cl. 252-501.000.

Marsland, Peter John: *See*—
Hoffman, John Ronald; and Marsland, Peter John, 4,060,885, Cl. 29-407.000.

Martel, Jacques; Buendia, Jean; and Vivat, Michel, to Roussel Uclaf. Prostanoic acid derivatives and therapeutic compositions. 4,061,729, Cl. 424-305.000.

Martignoni, Pasquale: *See*—
Chew, William M.; Ayers, Orval E.; Murfree, James A.; and Martignoni, Pasquale, 4,061,512, Cl. 149-22.000.

Martin, Charles Andrew: *See*—
Klisch, Stephen Cajetan; and Martin, Charles Andrew, 4,061,586, Cl. 252-153.000.

Martin Marietta Corporation: *See*—
Wade, Jackie F., 4,061,425, Cl. 356-110.000.

Martin, Wayne. Process for reducing platelet adhesiveness. 4,061,738, Cl. 424-195.000.

Martino, Dom. Automatic variable-sound alarm clock. 4,060,973, Cl. 58-19.00R.

Martino, Joseph F., Jr.: *See*—
King, Gerard J.; and Martino, Joseph F., Jr., 4,061,916, Cl. 250-332.000.

Marubishi Yuka Kogyo Kabushiki Kaisha: *See*—
Nishizawa, Kazuo; Higashitsuji, Ken; and Mori, Yuji, 4,061,557, Cl. 204-277.000.

Marvin Glass & Associates: *See*—
Breslow, Jeffrey D., 4,061,335, Cl. 273-134.0AT.
Meyer, Burton C.; and Allen, Robert K., 4,060,929, Cl. 46-11.000.

Masaki, Kenji; and Nagaisi, Hatuo, to Nissan Motor Co., Ltd. Exhaust gas reburning device. 4,060,983, Cl. 60-282.000.
Masciarelli, Francis John, to Data General Corporation. Indicia validation system. 4,061,900, Cl. 235-437.000.
Massey-Ferguson Services N.V.: *See*—
Metcalfe, Edward Geoffrey; and Ward, Walter Henry, 4,061,359, Cl. 280-638.000.
Mateer, George C.: *See*—
United States of America, National Aeronautics and Space Administration; Mateer, George C.; and Brosh, Aviel, 4,061,029, Cl. 73-180.000.
Mathevet, Albert: *See*—
Boileau, Jacques; and Mathevet, Albert, 4,061,171, Cl. 152-352.00R.
Mathues, Thomas P., to General Motors Corporation. Wheel brake assembly. 4,061,429, Cl. 188-206.00A.
Matsui, Takashi, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Method of manufacturing a packaging container. 4,060,958, Cl. 53-37.000.
Matsumoto, Junichiro: *See*—
Iizuka, Haruhiko; Matsumoto, Junichiro; and Kato, Fumiaki, 4,061,055, Cl. 74-866.000.
Matsumoto, Kazuo: *See*—
Miyoshi, Munetsugu; Matsumoto, Kazuo; Urabe, Yuji; and Iwasaki, Tameo, 4,061,650, Cl. 260-307.00F.
Matsumoto, Mitsuo, to Tokyo Shibaura Electric Co., Ltd. Numerical control system. 4,061,953, Cl. 318-573.000.
Matsumoto, Shigeru, to Victor Company of Japan, Limited. Cassette tape recorder having impact absorbing mechanism for cover plate. 4,061,378, Cl. 312-20.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Hashimoto, Kiyoshi; and Kitamura, Shigeki, 4,061,938, Cl. 310-168.000.
Kawashima, Kazumi, 4,061,982, Cl. 325-464.000.
Ueno, Tomoki, 4,061,990, Cl. 333-10.000.
Matsushita Electric Works, Ltd.: *See*—
Kimura, Rokusaburo; and Horii, Sadashige, 4,060,972, Cl. 58-16.00D.
Nakamura, Yoshimitsu, 4,061,056, Cl. 76-104.00R.
Matsushita, Kunichi; Sakurada, Hikaru; and Onuma, Kazuhiko, to Mitsubishi Chemical Industries Ltd. Process for preparing titanium oxide shaped carrier. 4,061,596, Cl. 252-463.000.
Matsushita, Takeshi; Hayashi, Hisao; and Shibasaki, Mitsuru, to Sony Corporation. Semiconductor device having a hetero junction. 4,062,034, Cl. 357-16.000.
Matsuura, Haruo, to Kabushiki Kaisha Daisho. Cutter. 4,060,893, Cl. 30-310.000.
Matsuura, Kazuo: *See*—
Kuroda, Nobuyuki; Shiraishi, Takeichi; Itoh, Akio; Matsuura, Kazuo; and Miyoshi, Mituji, 4,061,857, Cl. 526-114.000.
Mattel, Inc.: *See*—
Hirtle, Michael O'Hara; and Morse, James Edward, 4,060,930, Cl. 46-81.000.
Matuo, Ryukichi: *See*—
Kobayashi, Yoshinari; Matuo, Ryukichi; and Nishiyama, Masashi, 4,061,567, Cl. 210-40.000.
Maul, James J.; and Pattison, Victor A., to Hooker Chemicals & Plastics Corporation. Liquid phase fluorination process. 4,061,688, Cl. 260-651.00F.
Mautner, Edward J. Decorative panel of wood strips having sections of varying thickness. 4,061,809, Cl. 428-50.000.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
Hannig, Kurt; and Wirth, Hanns, 4,061,560, Cl. 204-299.00R.
Maxel, John M., to Armco Steel Corporation. Luggage shells and process for the manufacture thereof. 4,061,817, Cl. 428-246.000.
May, Brian E.: *See*—
Finigan, George D.; May, Brian E.; and Zaininger, Henry W., 4,060,916, Cl. 35-10.000.
May, George A.: *See*—
Collins, Galen R.; May, George A.; and Gendo, Indra Lee, 4,061,880, Cl. 179-15.0BA.
Mazarguil, Honore; Meiller, Francois; and Monsan, Pierre, to Rhone-Poulenc Industries. Modified, grafted mineral carriers. 4,061,828, Cl. 428-403.000.
McAllister, Ian R.: *See*—
Bennett, John A.; McAllister, Ian R.; and Welsh, Howard, 4,061,569, Cl. 210-83.000.
McBain, Robert T.; and Johnson, Bruce C., to Columbia Steel Casting Co. Inc. Drag chain. 4,060,978, Cl. 59-78.000.
McCanse, James Edson, to Hesston Corporation. Tractor mounted scraper blade. 4,061,194, Cl. 172-447.000.
McCaskey, Harold O., Jr.; and Palazzolo, Salvatore E., to Westinghouse Electric Corporation. Highly machinable cotton-phenolic base for decorative assemblies. 4,061,823, Cl. 428-318.000.
McClosky, Robert B.: *See*—
Hoffman, Louis S.; and McClosky, Robert B., 4,061,783, Cl. 426-87.000.
McCrickerd, John T. Odograph and heading indicator therefor. 4,061,995, Cl. 340-24.000.
McCulloch, Walter Graham, to Akzona Incorporated. Non-directional rectangular filaments and products. 4,061,804, Cl. 428-17.000.
McCullough, Robert E.: *See*—
O'Connor, Arthur H.; and McCullough, Robert E., 4,060,971, Cl. 58-4.00A.
McDaniel, Dwight W.: *See*—
Coleman, John R.; and McDaniel, Dwight W., 4,061,346, Cl. 277-205.000.
McDonald's Corporation: *See*—
Retelny, Andrew G., 4,061,241, Cl. 220-4.00B.
McDougald, Larry R., to Eli Lilly and Company. Coccidiocidal combination of monensin and metichlorpindol. 4,061,755, Cl. 424-263.000.
McElroy, David Joal, to Texas Instruments Incorporated. Correcting doping defects. 4,061,506, Cl. 148-1.500.
McFadden, Russell T.: *See*—
Gross, James R.; and McFadden, Russell T., 4,061,846, Cl. 526-16.000.
McFarland, Larry C.: *See*—
Johnson, Curtis D.; McFarland, Larry C.; and Antwiler, Lonnie D., 4,061,074, Cl. 89-33.0CA.
McGahren, William James: *See*—
Floyd, Middleton Brawner, Jr.; McGahren, William James; Schaub, Robert Eugene; and Weiss, Martin Joseph, 4,061,672, Cl. 260-514.00D.
McGauley, Patrick John. Process for the production of sorbent solids for use in the desulfurization of gases. 4,061,716, Cl. 423-244.000.
McGinnis, Hebert E., to First National Bank of Akron, Trustee, The. Stretchable belt conveyor. 4,061,223, Cl. 198-821.000.
McKeever, Bruce T.: *See*—
Sloane, Edwin A.; and McKeever, Bruce T., 4,061,017, Cl. 73-579.000.
McKinney, Joel Drexler; Sebulsky, Raynor T.; and Wynne, Francis Edmund, Jr., to Gulf Research & Development Company. Thermal cracking of hydrodesulfurized residual petroleum oils. 4,061,562, Cl. 208-61.000.
McLean, Daniel C.: *See*—
Shaler, Amos J.; and McLean, Daniel C., 4,061,807, Cl. 428-36.000.
McQue, David Wallace: *See*—
Dinsdale, Jack; McQue, David Wallace; and Vorley, Geoffrey, 4,061,952, Cl. 318-572.000.
Medovar, Boris Izrailevich: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.
Meeks, Dwight S. Storm cushion. 4,060,852, Cl. 2-84.000.
Meen, Ronald H.: *See*—
Jones, Glenn C.; and Meen, Ronald H., 4,061,548, Cl. 204-78.000.
Mehlschau, James J.: *See*—
Fridley, Robert B.; Chen, Pictiaw; Mehlschau, James J.; and Claypool, Lawrence L., 4,061,020, Cl. 73-81.000.
Mehta, Nariman Bomanshaw; and Brieaddy, Lawrence Edward, to Burroughs Wellcome Co. 2-Carbalkoxy-2'-cycloalkylaminocarbonyldiphenyl sulfides. 4,061,863, Cl. 560-18.000.
Meier, Ernst: *See*—
Monbaliu, Marcel Jacob; Mannens, Marc Godfried; Van Poucke, Raphael Karel; Credner, Hans-Heinrich; and Meier, Ernst, 4,061,498, Cl. 96-100.00R.
Meijs, Franciscus H.; and Davies, David R., to Shell Oil Company. Method for gaseous sand consolidation treatment of weak gas sands. 4,061,191, Cl. 166-292.000.
Meiller, Francois: *See*—
Mazarguil, Honore; Meiller, Francois; and Monsan, Pierre, 4,061,828, Cl. 428-403.000.
Meinan Machinery Works, Inc.: *See*—
Hasegawa, Katsuji, 4,061,169, Cl. 144-213.000.
Meiners, Hans-Joachim: *See*—
Hubner, Hans; Blahak, Johannes; and Meiners, Hans-Joachim, 4,061,697, Cl. 260-944.000.
Meinerz, Bernard J.: *See*—
Goble, Ralph W., 4,060,956, Cl. 53-22.00R.
Mejia, Reynaldo. Centrifugal fan for circulating room air. 4,061,441, Cl. 416-175.000.
Meng, Karl: *See*—
Horstmann, Harald; Meng, Karl; and Wehinger, Egbert, 4,061,653, Cl. 548-360.000.
Mercik, Henry J., Jr.: *See*—
Goodfriend, Harvey J.; Mercik, Henry J., Jr.; and Armstrong, Lee R., 4,061,026, Cl. 73-116.000.
Merck & Co., Inc.: *See*—
Cragoe, Edward J., Jr.; and Bicking, John B., 4,061,643, Cl. 260-295.00R.
Dybas, Richard A.; Grier, Nathaniel; and Witzel, Bruce E., 4,061,775, Cl. 424-330.000.
Muir, Larry A.; and Barreto, Albert, 4,061,732, Cl. 424-117.000.
Shen, Tsung-Ying; Jones, Howard; and Dorn, Conrad P., 4,061,759, Cl. 424-263.000.
Shepard, Kenneth L.; and Paleveda, William J., Jr., 4,061,763, Cl. 424-274.000.
Merianos, John J.: *See*—
Lada, Arnold; Petrocci, Alfonso N.; Green, Harold A.; and Merianos, John J., 4,061,750, Cl. 424-249.000.
Merk, Wolfgang: *See*—
Schwarze, Werner; Merk, Wolfgang; and Binder, Volker, 4,061,869, Cl. 526-1.000.
Merriken, Lyal N.: *See*—
Harper, George S.; and Merriken, Lyal N., 4,062,052, Cl. 361-28.000.

Merrow, Jack Kenneth: *See—*
Moore, Arthur William; Volk, Herbert Franz; and Merrow, Jack Kenneth, 4,061,600, Cl. 252-510.000.

Mertes, Paul M. Moulded plastic drawer slide. 4,061,375, Cl. 308-3.600.

Meshberg, Philip. Method of and apparatus for controlling of travel of the plunger in a dispensing pump chamber. 4,061,247, Cl. 222-1.000.

Messer Griesheim GmbH: *See—*
Gillitzer, Max; and Tajbl, Franz, 4,061,899, Cl. 219-131.00R.

Messler, James P.: *See—*
Messler, Joseph P.; Messler, Thomas E.; and Messler, James P., 4,060,928, Cl. 43-43.160.

Messler, Joseph P.; Messler, Thomas E.; and Messler, James P. Fish hook. 4,060,928, Cl. 43-43.160.

Messler, Thomas E.: *See—*
Messler, Joseph P.; Messler, Thomas E.; and Messler, James P., 4,060,928, Cl. 43-43.160.

Metallgesellschaft Aktiengesellschaft: *See—*
Moller, Friedrich-Wilhelm; Bratzler, Karl; and Muller, Wolf-Dieter, 4,061,475, Cl. 48-197.00R.

Metallurgie Hoboken-Overpelt: *See—*
De Schepper, Achille; and Van Peteghem, Antoine, 4,061,564, Cl. 210-21.000.

Metcalfe, Edward Geoffrey; and Ward, Walter Henry, to Massey-Ferguson Services N.V. Vehicles. 4,061,359, Cl. 280-638.000.

Meyer, Burton C.; and Allen, Robert K., to Marvin Glass & Associates. Toy detective set. 4,060,929, Cl. 46-11.000.

Michel, Max; and Poisson, Regis, to Rhone-Poulenc Industries. Alumina-based bodies obtained by agglomeration which are resistant to elevated temperatures. 4,061,594, Cl. 252-462.000.

Midcon Pipeline Equipment Co.: *See—*
Birdwell, J. C., 4,061,231, Cl. 214-1.00P.

Midgley, Richard John: *See—*
Selman, Gordon Leslie; and Midgley, Richard John, 4,061,495, Cl. 75-134.00F.

Mielke, Johannes: *See—*
Bantien, Jurgen; Bardenhagen, Dietrich; Mielke, Johannes; and Kruse, Friedel, 4,061,234, Cl. 214-6.00M.

Mietens, Gerhard: *See—*
Schallus, Erich; Mietens, Gerhard; Fucker, Gregor; Petrell, Jurgen; and Dorn, Friedrich Wilhelm, 4,061,719, Cl. 423-445.000.

Miida, Noboru: *See—*
Yokokawa, Takao; Kanazawa, Shogo; Otoguro, Yasuo; Suzuki, Nobukazu; Akase, Sigeyuki; Miida, Noboru; Akazawa, Tadahisa; and Kuroiwa, Kazuya, 4,061,494, Cl. 75-124.000.

Miksitz, Frank J., to UFI Engineering & Manufacturing Co., Inc. Controlled feeding of powders to conveying systems and process. 4,061,246, Cl. 222-1.000.

Miles Laboratories, Inc.: *See—*
Boyer, Ernest Wendell; and Ingle, Morton Blakeman, 4,061,541, Cl. 195-66.00R.
Havera, Herbert John; and Strycker, Wallace Glenn, 4,061,760, Cl. 424-267.000.

Miller, Carl W.; Vandenberg, Lester C.; and Statt, Wayne H., to Dow Corning Corporation. Manufacturing textured gloves of silicone rubber. 4,061,709, Cl. 264-293.000.

Miller, David D., to American Safety Equipment Corporation. Inflatable life vest. 4,060,867, Cl. 9-313.000.

Miller, Don W.; and Gerber, Mark S., to Ohio State University, The. Gamma camera system. 4,061,919, Cl. 250-363.00S.

Miller, Larry J.; Miller, Marion V.; and Liebetrau, Richard E., to Swiss Aluminium Limited. Revolving door with security locking mechanism. 4,060,935, Cl. 49-25.000.

Miller, Marilyn: *See—*
Morgan, Kenneth A.; and Miller, Marilyn, 4,061,712, Cl. 423-67.000.

Miller, Marion V.: *See—*
Miller, Larry J.; Miller, Marion V.; and Liebetrau, Richard E., 4,060,935, Cl. 49-25.000.

Milliken Research Corporation: *See—*
Tolan, John R., 4,061,524, Cl. 156-397.000.

Milne, James, to Balfour, Beatty & Company Limited. Artificial and natural structures. 4,060,953, Cl. 52-743.000.

Mimmack, William E.: *See—*
Kaprelian, Edward K.; and Mimmack, William E., 4,061,420, Cl. 350-199.000.

Minami, Norio: *See—*
Kijima, Shizumasa; Yamatsu, Isao; Minami, Norio; and Inai, Yuichi, 4,061,660, Cl. 260-396.00R.

Minhas, Pritam Singh; and Sukornick, Bernard, to Allied Chemical Corporation. Flame-retardant carpet and composition for preparing the same. 4,061,810, Cl. 428-85.000.

Minister of Defense, Canadian Government: *See—*
Hamid, Michael A.; and Rowlandson, Lyall G., 4,061,991, Cl. 333-22.00R.

Minks, Werner, to International Standard Electric Corporation. Miniature relay with bearing supports associated with the housing. 4,061,994, Cl. 335-202.000.

Minnesota Mining and Manufacturing Company: *See—*
Bast, Kenneth D.; and Kennelly, Jerauld M., 4,061,408, Cl. 339-75.00R.
DeMaster, Robert D., 4,061,268, Cl. 238-14.000.
Hampl, Edward F., Jr., 4,061,505, Cl. 136-238.000.
Nohtomi, Ryota; Sugiyama, Masayoshi; and Shigeyoshi, Tuyoshi, 4,061,707, Cl. 264-95.000.
Petras, Raymond J.; and Groff, Gaylord L., 4,061,826, Cl. 428-356.000.
Schultz, William J.; and Smith, Samuel, 4,061,624, Cl. 260-79.30M.

Minolta Camera Kabushiki Kaisha: *See—*
Kobori, Toshio; Tsujimoto, Kayoshi; Nanba, Yasuhiro; and Yamada, Seiji, 4,062,023, Cl. 354-38.000.

Minter, Jerry B. Apparatus for handling connectors. 4,061,405, Cl. 339-17.00M.

Misawa, Toshihiko: *See—*
Fujimoto, Sakae; Sue, Takaji; and Misawa, Toshihiko, 4,061,328, Cl. 271-10.000.

Mitsubishi Chemical Industries Ltd.: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; and Ikoma, Hidenobu, 4,061,776, Cl. 424-330.000.
Matsushita, Kunichi; Sakurada, Hikaru; and Onuma, Kazuhiko, 4,061,596, Cl. 252-463.000.
Onoda, Takeru; and Otake, Masayuki, 4,061,673, Cl. 260-526.00N.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Kiyota, Yuhiko, 4,061,118, Cl. 123-119.01R.

Mitsui, Isamu: *See—*
Inagami, Kaoru; Mitsui, Isamu; Nakamura, Chomatsu; and Nozaka, Toru, 4,061,792, Cl. 426-330.200.

Mitsui Mining & Smelting Co., Ltd.: *See—*
Kitamura, Tatsuzo; and Inaba, Haruji, 4,061,559, Cl. 204-106.000.

Mitumori, Yoshio: *See—*
Shigemori, Youjiro; Mitumori, Yoshio; and Yonezawa, Toshiaki, 4,062,050, Cl. 360-30.000.

Miura, Yoshio; Kobayashi, Kazuhiro; and Kotera, Masao, to Hitachi, Ltd. Winding machine for electric inductive apparatus. 4,061,289, Cl. 242-7.130.

Miyatani, Kazuo; and Sato, Isao, to RCA Corporation. Water photolysis apparatus. 4,061,555, Cl. 204-242.000.

Miyauchi, Kazunori: *See—*
Yamasaki, Akitosi; Fukuyama, Kiyoshi; and Miyauchi, Kazunori, 4,061,311, Cl. 254-168.000.

Miyazaki, Gentaro: *See—*
Hanma, Kentaro; and Miyazaki, Gentaro, 4,062,044, Cl. 358-21.000.

Miyazaki, Kazuo; and Ohmori, Sachio, to Nippon Kogaku K.K. Data exposure device for camera. 4,062,027, Cl. 354-127.000.

Miyoshi, Mituji: *See—*
Kuroda, Nobuyuki; Shiraishi, Takeichi; Itoh, Akio; Matsuura, Kazuo; and Miyoshi, Mituji, 4,061,857, Cl. 526-114.000.

Miyoshi, Munetsugu; Matsumoto, Kazuo; Urabe, Yuji; and Iwasaki, Tameo, to Tanabe Seiyaku Co., Ltd. 5-Trihalogenomethyl-4,5-dihyro-oxazole-4-carboxylic acid esters. 4,061,650, Cl. 260-307.00F.

Mizusawa, Kiyoshi: *See—*
Yoshida, Fumihiko; Mizusawa, Kiyoshi; and Nakamura, Kazuo, 4,061,540, Cl. 195-62.000.

Mizushina, Youichi, to Kokusai Electric Co., Ltd. Temperature control system. 4,061,870, Cl. 13-24.000.

Mobil Oil Corporation: *See—*
Kerr, George T.; and Rollmann, Louis D., 4,061,717, Cl. 423-329.000.
Nelson, Earnest E., 4,061,965, Cl. 324-29.000.

Mod, Robert R.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., to United States of America, Agriculture. Sulfur-containing antimicrobial ester-amides. 4,061,634, Cl. 544-158.000.

Modell, Michael, to Arthur D. Little, Inc. Process using a supercritical fluid for regenerating synthetic organic polymeric adsorbents and wastewater treatment embodying the same. 4,061,566, Cl. 210-32.000.

Moebius, Kurt O. Lockring tube joint. 4,061,367, Cl. 285-382.200.

Moertel, George B., to Textron Inc. Method and apparatus for manufacture of slide fastener stringer. 4,060,886, Cl. 29-410.000.

Mohr, Reinhard: *See—*
Fleckenstein, Erwin; Heinrich, Ernst; and Mohr, Reinhard, 4,061,642, Cl. 260-295.50A.

Mollendorf, Ralf; and Lux, Peter, to U.S. Philips Corporation. X-ray installation comprising an image intensifier/image pick-up tube system and an automatic X-ray exposure device. 4,061,920, Cl. 250-413.000.

Moller, Friedrich-Wilhelm; Bratzler, Karl; and Muller, Wolf-Dieter, to Metallgesellschaft Aktiengesellschaft. Process for producing a gas which can be substituted for natural gas. 4,061,475, Cl. 48-197.00R.

Monbaliu, Marcel Jacob; Mannens, Marc Godfried; Van Poucke, Raphael Karel; Credner, Hans-Heinrich; and Meier, Ernst, to AGFA-Gevaert, N.V. Photographic material containing 2-acyl-2-pyrazolin-5-on-couplers. 4,061,498, Cl. 96-100.00R.

Moncrieff-Yeates, Alexander J. Vortical flowaerothermodynamic heat exchanger. 4,061,189, Cl. 165-168.000.

Monsan, Pierre: *See—*
Mazarguil, Honore; Meiller, Francois; and Monsan, Pierre, 4,061,828, Cl. 428-403.000.

Monsanto Company: *See—*
Schleppnik, Alfred A., 4,061,667, Cl. 560-261.000.
Singleton, Thomas C., 4,061,546, Cl. 203-31.000.

Montblanc-Simplo GmbH.: *See—*
Herrnring, Heinz Gunther, 4,061,430, Cl. 401-216.000.

Montedison S.p.A.: *See—*
Fumagalli, Carlo; Caprara, Giuseppe; and Roffia, Paolo, 4,061,868, Cl. 560-246.000.
Giannarelli, Giancarlo; and Movilli, Walter, 4,061,462, Cl. 425-464.000.

Montgomery, James R.; and Saczawa, John S., Jr., to General Motors Corporation. Bumper having pivotal load spreader plate for deflecting energy absorbing medium. 4,061,384, Cl. 293-71.00R.

Moore, Arthur William; Volk, Herbert Franz; and Merrow, Jack Kenneth, to Union Carbide Corporation. Graphite electrode and method of making. 4,061,600, Cl. 252-510.000.

Moore Business Forms, Inc.: *See*—
Traise, John E., 4,061,527, Cl. 156-519.000.
Moore, Earl P., Jr., to Du Pont de Nemours, E. I., and Company. Catalyst composition of an azo nitrile mixture in an organic solvent. 4,061,590, Cl. 252-426.000.
Moore, Robert Rockwell: *See*—
Eitzen, Vincent Elliott; and Moore, Robert Rockwell, 4,061,315, Cl. 366-111.000.
Moreau, Marc, to Trefimetaux. Method for continuously measuring the annealing level on wires or strips. 4,061,508, Cl. 148-128.000.
Morgan, Kenneth A.; and Frame, Robert R., to UOP Inc. Recovery of vanadium values. 4,061,711, Cl. 423-67.000.
Morgan, Kenneth A.; and Miller, Marilyn, to UOP Inc. Recovery of vanadium values. 4,061,712, Cl. 423-67.000.
Mori, Yuji: *See*—
Nishizawa, Kazuo; Higashitsuji, Ken; and Mori, Yuji, 4,061,557, Cl. 204-277.000.
Morimura, Syoji: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,061,616, Cl. 260-45.80N.
Moriya, Yoshiaki: *See*—
Suzuki, Seigo; and Moriya, Yoshiaki, 4,062,059, Cl. 364-200.000.
Morley Company, The: *See*—
Olbres, Anthony, 4,061,227, Cl. 206-454.000.
Morris, Kent C.; Bonsen, Pieter; and Laver, Myron B., to Alza Corporation. Pharmaceutically acceptable intramolecularly cross-linked, stromal-free hemoglobin. 4,061,736, Cl. 424-177.000.
Morrison, Glenn C.: *See*—
Wise, Lawrence D.; and Morrison, Glenn C., 4,061,636, Cl. 260-250.00P.
Morrow, William D.: *See*—
Goss, John B.; Morrow, William D.; and Corbett, Jack William, 4,061,230, Cl. 212-70.000.
Morse, James Edward: *See*—
Hirtle, Michael O'Hara; and Morse, James Edward, 4,060,930, Cl. 46-81.000.
Morse Safety Products Co.: *See*—
Glazer, Joseph, 4,060,937, Cl. 51-80.00A.
Moschovis, Elias P.; and Gilson, John L., to A. B. Dick Company. Reainous pigment toner and liquid developer containing polyvinyl acetate coated on the pigment. 4,061,582, Cl. 252-62.10L.
Mostek Corporation: *See*—
Callahan, Michael James, Jr.; and Hoffman, Gordon Bates, 4,061,886, Cl. 179-84.0VF.
Donnelly, Robert Murray, 4,062,000, Cl. 365-203.000.
Proebsting, Robert J.; and Schroeder, Paul R., 4,061,954, Cl. 320-1.000.
Proebsting, Robert J.; and Schroeder, Paul R., 4,061,999, Cl. 365-182.000.
Schroeder, Paul R.; and Proebsting, Robert J., 4,061,933, Cl. 307-262.000.
Motch and Merryweather Machinery Company, The: *See*—
Nowak, Robert H., 4,060,880, Cl. 407-61.000.
Moteurs Leroy-Somer: *See*—
Peltier, Francois, 4,061,062, Cl. 82-2.700.
Motley, David M.; and Kameya, Andrew M., to Hycom Incorporated. Phase tracking network. 4,061,977, Cl. 325-323.000.
Motley, David M.; Salman, Naif D.; and Cheng, King Y., to Hycom Incorporated. Timing recovery for an automatically equalized data modem. 4,061,978, Cl. 325-324.000.
Motorola, Inc.: *See*—
Nash, Harold Garth; and Whitmore, Jack, 4,061,885, Cl. 179-84.0VF.
Reimers, Fred Alan; Beckmann, Robert Martin; Burzynski, William Arthur; Tomlinson, Dennis Eugene; and Schwartz, William Henry, 4,061,973, Cl. 325-17.000.
Movilli, Walter: *See*—
Giannarelli, Giancarlo; and Movilli, Walter, 4,061,462, Cl. 425-464.000.
Mueller, Herold. Multiple-blade band saw. 4,061,066, Cl. 83-808.000.
Muenster, Alfred, to BASF Aktiengesellschaft. Process for the recovery of gaseous or vaporous monomers from reaction off-gases. 4,061,849, Cl. 526-68.000.
Muhlfeld, Frank J. Conversion kit for a sailboat. 4,061,100, Cl. 114-43.000.
Muir, Larry A.; and Barreto, Albert, to Merck & Co., Inc. Control of lactic acidosis in ruminants. 4,061,732, Cl. 424-117.000.
Mulder, Franciscus Elbertus, to Proost en Brandt N.V. Extruder for the manufacture of a synthetic resin foil in the shape of a serpentine strip. 4,061,456, Cl. 425-140.000.
Muller, Jurgen: *See*—
Pfeifer, Josef; Rheude, Alfred; and Muller, Jurgen, 4,061,915, Cl. 250-315.00A.
Muller, Ulrich R.: *See*—
Fricke, J. P.; and Muller, Ulrich R., 4,061,874, Cl. 179-1.00P.
Muller, Wolf-Dieter: *See*—
Moller, Friedrich-Wilhelm; Bratzler, Karl; and Muller, Wolf-Dieter, 4,061,475, Cl. 48-197.00R.
Mundus, Friedhelm; and Schneider, Horst, to Windmoller & Holscher. Apparatus for processing a web of material without a standstill. 4,061,458, Cl. 425-392.000.
Mune, Takashi: *See*—
Horie, Koji; and Mune, Takashi, 4,061,098, Cl. 113-116.00Q.
Mura, Lawrence A.: *See*—
Tai, Wun Ten; Mura, Lawrence A.; Phillips, Kenneth G.; and Ballweber, Edward G., 4,061,695, Cl. 260-929.000.
Murakami, Heiichiro; and Okamoto, Tsuneo, to Taiyo Kaken Company, Ltd. Method and apparatus for the purification of waste gas containing gaseous pollutants. 4,061,477, Cl. 55-79.000.
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Mashaharu; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. Device for preventing erroneous handling of a camera. 4,062,022, Cl. 354-38.000.
Murata Manufacturing Co., Ltd.: *See*—
Murata, Michihiro; and Kitao, Akihiro, 4,061,583, Cl. 252-62.3BT.
Murata, Masahiro, to Hope Co. Ltd. Ski boot toe binding. 4,061,358, Cl. 280-629.000.
Murata, Michihiro; and Kitao, Akihiro, to Murata Manufacturing Co., Ltd. Preparation of titanates. 4,061,583, Cl. 252-62.3BT.
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, to Sankyo Company Limited. Stabilization of synthetic polymers. 4,061,616, Cl. 260-45.80N.
Murayama, Keiya: *See*—
Tsunekawa, Tokuichi; Uchidoi, Masanori; Shimizu, Masami; Yamamichi, Masayoshi; Murayama, Keiya; and Aizawa, Hiroshi, 4,062,024, Cl. 354-60.00R.
Murfree, James A.: *See*—
Chew, William M.; Ayers, Orval E.; Murfree, James A.; and Martignoni, Pasquale, 4,061,512, Cl. 149-22.000.
Murie, Richard A.: *See*—
Sharma, Ram A.; Wright, Walter J.; and Murie, Richard A., 4,061,841, Cl. 429-112.000.
Murray, John S.; and Sunjara, Sime, to Redken Laboratories, Inc. Heat cap. 4,061,898, Cl. 219-211.000.
Muschaweck, Roman: *See*—
Lang, Hans-Jochen; and Muschaweck, Roman, 4,061,647, Cl. 260-306.70T.
Lang, Hans-Jochen; and Muschaweck, Roman, 4,061,761, Cl. 424-270.000.
Muschelknautz, Edgar: *See*—
Brauner, Dieter; Kaluza, Hans-Joachim; and Muschelknautz, Edgar, 4,061,313, Cl. 366-340.000.
Musial, George J. Valve with combination lock and remote control. 4,061,158, Cl. 137-552.500.
Musil, Josef: *See*—
Teufel, Hermann; Bartmann, Wilhelm; Granzer, Ernold; and Musil, Josef, 4,061,772, Cl. 424-304.000.
Musser, Malcolm E. Checkout assembly having dual bagging station. 4,061,205, Cl. 186-1.00A.
N. V. Joseph Mertens International: *See*—
Goyvaerts, Edward C., 4,061,091, Cl. 108-84.000.
N. V. Raychem S.A.: *See*—
De Groef, Pierre, 4,060,887, Cl. 29-626.000.
Nabisco, Inc.: *See*—
Pinto, Albert A.; and Stanley, Alexander J., 4,061,081, Cl. 93-53.0SD.
Nadelson, Jeffrey, to Sandoz, Inc. Iminodimethylene di-tert-alkylophenones and phenols. 4,061,778, Cl. 424-330.000.
Nagahama, Yasuo, to Nippon Gakki Seizo Kabushiki Kaisha. Voltage-controlled type oscillator. 4,061,987, Cl. 331-111.000.
Nagahama, Yasuo, to Nippon Gakki Seizo Kabushiki Kaisha. Non-linear type digital-to-analog converter. 4,062,013, Cl. 340-347.0DA.
Nagaisi, Hatuo: *See*—
Masaki, Kenji; and Nagaisi, Hatuo, 4,060,983, Cl. 60-282.000.
Nagano, Toshio; and Kuramoto, Kazuo, to Nissan Motor Co., Ltd. Safety system for protection of automotive seat occupant. 4,061,365, Cl. 280-745.000.
Nagaoka, Kenji: *See*—
Itoh, Iko; Inoue, Yasuhiko; and Nagaoka, Kenji, 4,061,844, Cl. 526-4.000.
Nagaoka, Shinji: *See*—
Kitai, Kiyoshi; Nakamura, Yukio; Kato, Shogo; and Nagaoka, Shinji, 4,062,029, Cl. 354-232.000.
Nagatome, Kenji: *See*—
Toyota, Hiroshi; Nagatome, Kenji; and Kawamoto, Tamio, 4,061,217, Cl. 192-.052.
Nagle, William J.: *See*—
Thomas, Ralph D.; and Nagle, William J., 4,061,955, Cl. 320-6.000.
Naka, Hiromitsu. Flexible non-skid strip with reinforcing web member. 4,060,947, Cl. 52-179.000.
Nakagawa, Jihei, to Olympus Optical Co., Ltd. Retrofocus type lens system having ultra-wide angle of view. 4,061,421, Cl. 350-214.000.
Nakagawa, Koithiro: *See*—
Yoshida, Toru; Hosoi, Kameo; Yoshida, Tokuzo; Shimizu, Kazuyuki; and Nakagawa, Koithiro, 4,060,913, Cl. 34-80.000.
Nakagome, Takenari: *See*—
Yamada, Hirotada; Okamura, Kosaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,061,748, Cl. 424-246.000.
Nakamura, Chomatsu: *See*—
Inagami, Kaoru; Mitsui, Isamu; Nakamura, Chomatsu; and Nozaka, Toru, 4,061,792, Cl. 426-330.200.
Nakamura, Kazuo: *See*—
Yoshida, Fumihiko; Mizusawa, Kiyoshi; and Nakamura, Kazuo, 4,061,540, Cl. 195-62.000.
Nakamura, Masaji: *See*—
Amano, Tadashi; and Nakamura, Masaji, 4,061,428, Cl. 356-175.000.
Nakamura, Yoshimitsu, to Matsushita Electric Works, Ltd. Method of making outer blades for electric shavers. 4,061,056, Cl. 76-104.00R.

Nakamura, Yukio: *See*—
Kitai, Kiyoshi; Nakamura, Yukio; Kato, Shogo; and Nagaoka, Shinji, 4,062,029, Cl. 354-232.000.

Nalco Chemical Company: *See*—
Tai, Wun Ten; Mura, Lawrence A.; Phillips, Kenneth G.; and Ballweber, Edward G., 4,061,695, Cl. 260-929.000.

Nanba, Yasuhiro: *See*—
Kobori, Toshio; Tsujimoto, Kayoshi; Nanba, Yasuhiro; and Yamada, Seiji, 4,062,023, Cl. 354-38.000.

Narisada, Masayuki, to Shionogi & Co., Ltd. Dihydroethanoanthracene derivatives useful as antidepressants. 4,061,854, Cl. 544-88.000.

Nash, Harold Garth; and Whitmore, Jack, to Motorola, Inc. Digital tone decoder. 4,061,885, Cl. 179-84.0VF.

National Can Corporation: *See*—
Wessman, Elbert F., 4,061,012, Cl. 72-347.000.

National Gypsum Company: *See*—
Rackard, Troy D.; and Snider, Grover E., 4,060,950, Cl. 52-456.000.

National Research Development Corporation: *See*—
Edwards, Nigel, 4,060,856, Cl. 3-1.300.
New, Ronald William, 4,061,438, Cl. 408-143.000.

National Starch and Chemical Corporation: *See*—
Stanley, Henry; and Ray-Chaudhuri, Dilip K., 4,061,618, Cl. 260-29.2TN.

Natori, Minoru; Hatuse, Toshikazu; Kawanobe, Kouhei; Ogawa, Hiroshi; Sekiya, Fukuo; Ebihara, Heihachiro; and Uchino, Misao, to Citizen Watch Company Limited. Method and apparatus for driving electrochromic display device. 4,060,974, Cl. 58-23.00R.

Naturin-Werk Becker & Co.: *See*—
Winkler, Bruno; Mangei, Bernd; and Fritz, Dieter, 4,061,786, Cl. 426-138.000.

Neilson, John Manning Savidge, to RCA Corporation. Gate turn off semiconductor rectifiers. 4,062,032, Cl. 357-13.000.

Nelson, Earnest E., to Mobil Oil Corporation. Method and apparatus for monitoring a cathodically protected corrodible hollow member. 4,061,965, Cl. 324-29.000.

Nelson, Rodney L., to Baughman, Ray M., a part interest. Mining method and apparatus. 4,061,399, Cl. 299-18.000.

Nerem, Arne, to Rohr Industries, Incorporated. Base drive inhibit circuit. 4,061,930, Cl. 307-254.000.

New, Ronald William, to National Research Development Corporation. Boring bars. 4,061,438, Cl. 408-143.000.

Newhouse, Thomas Charles, to Deere & Company. Pulley half mounting of variable speed pulley. 4,061,047, Cl. 74-230.17C.

Newland, Julian Harold: *See*—
Lazarus, Stanley David; and Newland, Julian Harold, 4,061,708, Cl. 264-211.000.

Newman, William Albert: *See*—
Brown, Lowell K.; Newman, William Albert; and Boyd, William A., 4,061,956, Cl. 320-22.000.

Newspaper Equipment Company: *See*—
Hill, George B., 4,061,087, Cl. 101-415.100.

Nichiyu Kagaku Co., Ltd.: *See*—
Yoshida, Moritoshi; Yamamoto, Takashi; and Nii, Sumito, 4,061,780, Cl. 424-358.000.

Nicks, Oran W. Aircraft total energy sensor. 4,061,028, Cl. 73-179.000.

Nielsen, Robert P.; and Kilty, Peter A., to Shell Oil Company. Process for the production of ethylene oxide. 4,061,659, Cl. 260-348.340.

Niethammer, Dieter; and Paetsch, Werner, to Siemens Aktiengesellschaft. Circuit arrangement for the reception of data. 4,061,997, Cl. 340-146.1AX.

Nifco Inc.: *See*—
Kurosaki, Mutsuo, 4,061,299, Cl. 248-73.000.

Nii, Sumito: *See*—
Yoshida, Moritoshi; Yamamoto, Takashi; and Nii, Sumito, 4,061,780, Cl. 424-358.000.

Nikitina, Ljudmila Nikolaevna: *See*—
Ivanova, Raisa Vasilievna; Belsky, Arkady Andreevich; Novikov, Nikolai Alexandrovich; Alexeeva, Nina Nikolaevna; Nikitina, Ljudmila Nikolaevna; Ljubimova, Nina Andreevna; and Dotsenko, Anna Evgenievna, 4,061,551, Cl. 204-105.00R.

Nilson, Billy N., to KeNova AB. Dispensing valve. 4,061,254, Cl. 222-494.000.

Nippon Electric Company, Ltd.: *See*—
Okamoto, Kiyokazu; and Hayashi, Hitoshi, 4,061,907, Cl. 364-718.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Nagahama, Yasuo, 4,061,987, Cl. 331-111.000.
Nagahama, Yasuo, 4,062,013, Cl. 340-347.0DA.
Yoshida, Takashi, 4,062,036, Cl. 357-22.000.

Nippon Kogaku K.K.: *See*—
Miyazaki, Kazuo; and Ohmori, Sachio, 4,062,027, Cl. 354-127.000.
Toyoda, Kenji, 4,061,431, Cl. 356-227.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Nomura, Hirokazu; Tohno, Katsumi; and Takahashi, Tomio, 4,061,262, Cl. 228-50.000.

Nippon Mining Co., Ltd.: *See*—
Ozaki, Hiromi; Yamane, Mamoru; Kodama, Hachio; and Yoshika, Haruo, 4,061,472, Cl. 44-1.00R.

Nippon Oil Company Ltd.: *See*—
Kuroda, Nobuyuki; Shiraishi, Takeichi; Itoh, Akio; Matsuura, Kazuo; and Miyoshi, Mituji, 4,061,857, Cl. 526-114.000.

Nippon Piston Ring Kabushiki Kaisha: *See*—
Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, 4,061,446, Cl. 418-133.000.

Nippon Soken, Inc.: *See*—
Kuno, Akira; and Shinoda, Yoshio, 4,061,023, Cl. 73-114.000.

Nippon Steel Corporation: *See*—
Sugai, Tetuya, 4,061,975, Cl. 325-322.000.
Sugai, Tetuya, 4,061,976, Cl. 325-322.000.
Yokokawa, Takao; Kanazawa, Shogo; Otoguro, Yasuo; Suzuki, Nobukazu; Akase, Sigeyuki; Miida, Noboru; Akazawa, Tadahisa; and Kuroiwa, Kazuya, 4,061,494, Cl. 75-124.000.
Yoshida, Toru; Hosoi, Kameo; Yoshida, Tokuzo; Shimizu, Kazuyuki; and Nakagawa, Koithiro, 4,060,913, Cl. 34-80.000.

Nippon Zeon Co. Ltd.: *See*—
Kamiya, Shigemitsu, 4,061,693, Cl. 260-876.00R.

Nishikawa, Tatsuo; and Ozawa, Toshiaki, to Canon Kabushiki Kaisha. Printing device. 4,061,219, Cl. 197-164.000.

Nishimura, Izuhiko, to Kabushiki Kaisha Suwa Seikosha. Semi-conductor integrated circuit. 4,062,039, Cl. 357-51.000.

Nishino, Tetsuya; and Yasuda, Shigeyuki. Method and device for preserving vegetables. 4,061,785, Cl. 426-124.000.

Nishiumi, Shiro: *See*—
Takase, Hideo; Ishii, Toyota; and Nishiumi, Shiro, 4,061,811, Cl. 428-95.000.

Nishiyama, Masashi: *See*—
Kobayashi, Yoshinari; Matuo, Ryukichi; and Nishiyama, Masashi, 4,061,567, Cl. 210-40.000.

Nishiyama, Yukinori, to Sumitomo Electric Industries, Ltd. Pad-wear compensating device for disc brake. 4,061,208, Cl. 188-71.900.

Nishizawa, Kazuo; Higashitsuji, Ken; and Mori, Yuji, to Marubishi Yuka Kogyo Kabushiki Kaisha; and Nishizawa, Kazuo. Assembly of electrodes. 4,061,557, Cl. 204-277.000.

Nissan Motor Co., Ltd.: *See*—
Hoshino, Kazuo; and Tanbara, Masakazu, 4,061,211, Cl. 188-79.50P.
Iizuka, Haruhiko; Matsumoto, Junichiro; and Kato, Fumiaki, 4,061,055, Cl. 74-866.000.
Ikeura, Kenji, 4,061,117, Cl. 123-119.0EC.
Masaki, Kenji; and Nagaisi, Hatuo, 4,060,983, Cl. 60-282.000.
Nagano, Toshio; and Kuramoto, Kazuo, 4,061,365, Cl. 280-745.000.
Saida, Yoshinori; and Katoh, Kazumasa, 4,061,116, Cl. 123-117.00D.
Toyota, Hiroshi; Nagatome, Kenji; and Kawamoto, Tamio, 4,061,217, Cl. 192-.052.

Nixon, Peter Anthony, to Development Finance Corporation. Temperature function integrator. 4,061,033, Cl. 73-339.00R.

Noel, Jean Pierre; and Bauer, Gilbert, to Ste Anonyme Dite Brasseries Kron Enbourg. Method and apparatus for measuring the foam life on an effervescent beverage. 4,061,016, Cl. 73-60.100.

Noguchi, Hiroshi: *See*—
Yamada, Hirotada; Okamura, Kosaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,061,748, Cl. 424-246.000.

Nohtomi, Ryota; Sugiyama, Masayoshi; and Shigeyoshi, Tuyoshi, to Minnesota Mining and Manufacturing Company. Process and apparatus for heat setting biaxially oriented tubular polyethylene terephthalate films. 4,061,707, Cl. 264-95.000.

Nolan, John Howard; Goddard, Donald Lawrence; and Short, Barrett John, to Babcock & Wilcox Company, The. Industrial technique. 4,061,535, Cl. 176-38.000.

Nomura, Hirokazu; Tohno, Katsumi; and Takahashi, Tomio, to Nippon Kokan Kabushiki Kaisha. Self-running one-side welding facilities. 4,061,262, Cl. 228-50.000.

Nordstrom, Sigurd Andrew Mauritz, to Saab-Scania Aktiebolag. Bearing arrangement for non-powered wheels on vehicles. 4,061,377, Cl. 308-207.00R.

Noritsu Koki Co., Ltd.: *See*—
Onishi, Tetsuo, 4,061,424, Cl. 355-63.000.

Norris, Robert S. Process to embody waste automotive lubricating oils into a fuel additive to reduce corrosion and deposits and augment energy availability. 4,061,473, Cl. 44-51.000.

Northern Telecom Limited: *See*—
Gumb, Beverley William; Kuhfus, Gerd; and Cogan, Fredrick Thomas, 4,061,411, Cl. 339-159.00R.

Novak, Arthur F.: *See*—
Mod, Robert R.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 4,061,634, Cl. 544-158.000.

Novikov, Nikolai Alexandrovich: *See*—
Ivanova, Raisa Vasilievna; Belsky, Arkady Andreevich; Novikov, Nikolai Alexandrovich; Alexeeva, Nina Nikolaevna; Nikitina, Ljudmila Nikolaevna; Ljubimova, Nina Andreevna; and Dotsenko, Anna Evgenievna, 4,061,551, Cl. 204-105.00R.

Nowak, Robert H., to Motch and Merryweather Machinery Company, The. Circular saw having an improved tooth geometry and method of making the same. 4,060,880, Cl. 407-61.000.

Nowak, Terrance M.: *See*—
Bott, Gerald J.; Porter, William C.; and Nowak, Terrance M., 4,061,014, Cl. 73-45.100.

Nozaka, Toru: *See*—
Inagami, Kaoru; Mitsui, Isamu; Nakamura, Chomatsu; and Nozaka, Toru, 4,061,792, Cl. 426-330.200.

Nussbaumer, Henri J., to International Business Machines Corporation. Digital filter. 4,062,060, Cl. 364-724.000.

Nusslein, Ludwig; Pieroh, Ernst Albrecht; and Roder, Kurt, to Schering Aktiengesellschaft. 2-Trichloromethyl-5-methylsulfinyl-1,3,4-thiadiazole. 4,061,645, Cl. 260-302.0SD.

N.V. Optische Industrie "de Oude Delft": *See*—
van der Does, Lucas, 4,061,923, Cl. 250-468.000.

Oak Industries Inc.: *See—*
Lewandowski, Raymond F., 4,061,988, Cl. 338-32.00H.

Oberstar, Helen Elizabeth; and Westman, Morton Alan, to American Cyanamid Company. Conditioning shampoo composition containing a cationic derivative of a natural gum (such as guar) as the active conditioning ingredient. 4,061,602, Cl. 252-547.000.

Oce-van der Grinten N.V.: *See—*
Geurts, Petrus T. J.; and Wittenberg, Albert J., 4,061,422, Cl. 350-293.000.

O'Connor, Arthur H.; and McCullough, Robert E., to Time Computer, Inc. Solid state watch with inertial switch. 4,060,971, Cl. 58-4.00A.

O'Cull, Kathleen A.: *See—*
Dasher, George F.; O'Cull, Kathleen A.; and Schamper, Thomas J., 4,061,150, Cl. 132-7.000.

Offermanns, Heribert: *See—*
Asinger, Friedrich; Pfeifer, Wolf-Dieter; Offermanns, Heribert; Scherberich, Paul; and Schreyer, Gerd, 4,061,674, Cl. 260-534.00S.

Ogata, Masaru: *See—*
Yukinaga, Hisajiro; Kano, Hideo; and Ogata, Masaru, 4,061,490, Cl. 71-68.000.

Ogawa, Hiroshi: *See—*
Natori, Minoru; Hatuse, Toshikazu; Kawanobe, Kouhei; Ogawa, Hiroshi; Sekiya, Fukuo; Ebihara, Heihachiro; and Uchino, Misao, 4,060,974, Cl. 58-23.00R.

Ohio State University, The: *See—*
Miller, Don W.; and Gerber, Mark S., 4,061,919, Cl. 250-363.00S.
Young, Jonathan D.; and Caldecott, Ross, 4,062,010, Cl. 343-5.0NA.

Ohlinger, Manfred; Schoenafinger, Eduard; Schneider, Walter; Stritzinger, Heinz; and Vaeth, Guenter, to BASF Aktiengesellschaft. Manufacture of gamma-iron(III) oxide. 4,061,725, Cl. 423-634.000.

Ohlinger, Manfred; Schoenafinger, Eduard; Vaeth, Guenter; Stritzinger, Heinz; Koester, Eberhard; Schneehage, Hans Henning; and Steck, Werner, to BASF Aktiengesellschaft. Manufacture of acicular γ-iron(III) oxide. 4,061,726, Cl. 423-634.000.

Ohlinger, Manfred: *See—*
Vaeth, Guenter; Ohlinger, Manfred; Stritzinger, Heinz; Schoenafinger, Eduard; Wettstein, Eugen; and Guth, Wolfgang, 4,061,727, Cl. 423-634.000.

Ohlsson, Korfitz Bengt-Ingvar: *See—*
Eriksoo, Edgar; and Ohlsson, Korfitz Bengt-Ingvar, 4,061,747, Cl. 424-244.000.

Ohlstein, Herbert, to International Telephone and Telegraph Corporation. Method of bonding a dielectric substrate to a metallic carrier in a printed circuit assembly. 4,061,263, Cl. 228-124.000.

Ohmori, Sachio: *See—*
Miyazaki, Kazuo; and Ohmori, Sachio, 4,062,027, Cl. 354-127.000.

Ohno, Masaji; and Kataoka, Mutsuo, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Method and composition for treating hypertension. 4,061,769, Cl. 424-283.000.

Ohshiro, Takeshi: *See—*
Funakoshi, Satoshi; Omura, Takao; and Ohshiro, Takeshi, 4,061,735, Cl. 424-177.000.

Ohtsuka, Norio, to Bridgestone Cycle Industry Co., Ltd. Display device for bicycle brake shoes. 4,061,229, Cl. 206-486.000.

Ohyama, Isao: *See—*
Hayashi, Masaki; Tanouchi, Tadao; Ito, Hiroyuki; and Ohyama, Isao, 4,061,865, Cl. 560-121.000.

Okamoto, Kiyokazu; and Hayashi, Hitoshi, to Nippon Electric Company, Ltd. Interpolator for a numerically controlled machine with step size selected in response to feed rate. 4,061,907, Cl. 364-718.000.

Okamoto, Tsuneo: *See—*
Murakami, Heiichiro; and Okamoto, Tsuneo, 4,061,477, Cl. 55-79.000.

Okamura, Kosaku: *See—*
Yamada, Hirotada; Okamura, Kosaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,061,748, Cl. 424-246.000.

Oki, Tsutomu: *See—*
Kondo, Takajiro; Asamoto, Toshitaka; and Oki, Tsutomu, 4,060,892, Cl. 30-253.000.

Olbres, Anthony, to Morley Company, The. Shock and heat resistant storage unit. 4,061,227, Cl. 206-454.000.

Oliver, Roy; and Royer, Garfield P., to Pierce Chemical Company. Selective adsorbent for use in affinity chromatography. 4,061,591, Cl. 252-430.000.

Olsin, Albert. Metal working compound. 4,060,943, Cl. 51-281.00R.

Olson, Daniel R.: *See—*
Schroeter, Siegfried H.; and Olson, Daniel R., 4,061,652, Cl. 260-308.00B.

Olympus Optical Co., Ltd.: *See—*
Nakagawa, Jihei, 4,061,421, Cl. 350-214.000.

Omark Industries, Inc.: *See—*
Hille, Arvin A., 4,060,895, Cl. 30-384.000.

Omura, Takao: *See—*
Funakoshi, Satoshi; Omura, Takao; and Ohshiro, Takeshi, 4,061,735, Cl. 424-177.000.

Onder, Besir K., to Upjohn Company, The. Preparation of polyamide from organic diisocyanate with alkali metal salt of alcohol as catalyst. 4,061,622, Cl. 260-78.00R.

Onder, Besir K., to Upjohn Company, The. Preparation of polyamideimide from organic diisocyanate with alkali metal salt of alcohol as catalyst. 4,061,623, Cl. 260-78.0TF.

Onishi, Tetsuo, to Noritsu Koki Co., Ltd. Photographic enlarger with means for trimming. 4,061,424, Cl. 355-63.000.

Ono Pharmaceutical Company: *See—*
Hayashi, Masaki; Tanouchi, Tadao; Ito, Hiroyuki; and Ohyama, Isao, 4,061,865, Cl. 560-121.000.

Onoda, Takeru; and Otake, Masayuki, to Mitsubishi Chemical Industries Ltd. Manufacture of methacrylic acid. 4,061,673, Cl. 260-526.00N.

Onodera, Toshimi: *See—*
Kotezawa, Katsutaka; Onodera, Toshimi; Hayashi, Setsuo; and Shimanuki, Fujio, 4,062,016, Cl. 343-178.000.

Onuma, Kazuhiko: *See—*
Matsushita, Kunichi; Sakurada, Hikaru; and Onuma, Kazuhiko, 4,061,596, Cl. 252-463.000.

Or Da Industries Ltd.: *See—*
Coster, Theo Maurice Simon, 4,061,339, Cl. 273-157.00R.

Orth, Harold R.; and Swanson, William C., to International Harvester Company. Load sensing pull-type hydraulic amplifying fluid motor. 4,061,079, Cl. 91-372.000.

Ortho Pharmaceutical Corporation: *See—*
Hirsch, Allen Frederick, 4,061,663, Cl. 260-456.00A.
Kanojia, Ramesh M.; and Levine, Seymour D., 4,061,739, Cl. 424-195.000.

Orthwein, William C. Clip-on dental restoration and tools for removing same. 4,060,898, Cl. 32-40.00R.

Ortloff Corporation, The: *See—*
Campbell, Roy E.; Lawrence, John B.; and Tonne, Ronald Ray, 4,061,481, Cl. 62-29.000.

Orzalesi, Giovanni; and Selleri, Renato, to Societa Italo-Britannica L. Manetti - H. Roberts & C. Process for the preparation of 2-(4-isobutylphenyl)-propiohydroxamic acid. 4,061,668, Cl. 260-500.50H.

Otake, Masayuki: *See—*
Onoda, Takeru; and Otake, Masayuki, 4,061,673, Cl. 260-526.00N.

Otoguro, Yasuo: *See—*
Yokokawa, Takao; Kanazawa, Shogo; Otoguro, Yasuo; Suzuki, Nobukazu; Akase, Sigeyuki; Miida, Noboru; Akazawa, Tadahisa; and Kuroiwa, Kazuya, 4,061,494, Cl. 75-124.000.

Ott, Arthur Richard, to Electrohome Limited. D.C. controlled attenuator. 4,062,042, Cl. 358-27.000.

Owen, Shubel H.: *See—*
Felker, Paul J.; and Owen, Shubel H., 4,061,276, Cl. 241-69.000.

Owens-Corning Fiberglas Corporation: *See—*
Powers, Thomas V., Jr., 4,061,285, Cl. 242-18.00R.
Rimmel, Carl F., 4,061,485, Cl. 65-4.00R.

Owens-Illinois, Inc.: *See—*
Zielinski, Eugene J., 4,060,889, Cl. 29-628.000.

Oxford Chemicals, Incorporated: *See—*
Magid, Robert P.; and Sly, Gerald, 4,061,820, Cl. 428-311.000.

Oy E. Sarlin AB: *See—*
Lund, Rolf, 4,061,345, Cl. 277-88.000.

Ozaki, Hiromi; Yamane, Mamoru; Kodama, Hachio; and Yoshika, Haruo, to Nippon Mining Co., Ltd. Process for producing synthetic caking coal and binder pitch. 4,061,472, Cl. 44-1.00R.

Ozawa, Toshiaki: *See—*
Nishikawa, Tatsuo; and Ozawa, Toshiaki, 4,061,219, Cl. 197-164.000.

P. R. Mallory & Co. Inc.: *See—*
Scott, Charles E., 4,062,007, Cl. 340-309.100.

Pacheco, Luciano: *See—*
van der Gaag, Leonard C.; and Pacheco, Luciano, 4,061,925, Cl. 250-553.000.

Paddock, Gordon R., to General Motors Corporation. Air switching diverter valve. 4,060,984, Cl. 60-290.000.

Paetsch, Werner: *See—*
Niethammer, Dieter; and Paetsch, Werner, 4,061,997, Cl. 340-146.1AX.

Palazzolo, Salvatore E.: *See—*
McCaskey, Harold O., Jr.; and Palazzolo, Salvatore E., 4,061,823, Cl. 428-318.000.

Paleveda, William J., Jr.: *See—*
Shepard, Kenneth L.; and Paleveda, William J., Jr., 4,061,763, Cl. 424-274.000.

Palmer, John P.; Isbister, Stephen W.; and Elvin, John D. F., to ITW Limited. Catches. 4,061,369, Cl. 292-163.000.

Papenfuhs, Theodor: *See—*
Hahnke, Manfred; Hohmann, Kurt; and Papenfuhs, Theodor, 4,061,464, Cl. 8-79.000.

Papkov, Oleg Sergeevich: *See—*
Lifshits, Viktor Senderovich; Petrov, Georgy Nikolaevich; Papkov, Oleg Sergeevich; Khomenko, Vladimir Ivanovich; Gerasimenko, Alexandr Yakovlevich; Taradaiko, Alexandr Korneevich; Zemchenko, Alexandr Mikhailovich; and Gremyakov, Ivan Petrovich, 4,061,078, Cl. 90-24.00C.

Pappanikolaou, George. Pick-proof lock cylinder and key therefor. 4,061,004, Cl. 70-363.000.

Parke, Davis & Company: *See—*
Hastings, Stephen G.; Poschel, Bruno P. H.; and Butler, Donald E., 4,061,756, Cl. 424-263.000.

Parker, John A.: *See—*
Gilwee, William J., Jr.; and Parker, John A., 4,061,812, Cl. 428-117.000.

Parker, Sidney A.: *See—*
Dirk, William R.; and Parker, Sidney A., 4,061,444, Cl. 417-312.000.

Parkes, David M., to Kaiser Resources Ltd. Hydraulic mining apparatus and method. 4,061,398, Cl. 299-17.000.

Parks, Robert R., to General Motors Corporation. Leaf spring suspension system. 4,061,364, Cl. 280-718.000.

Parmann, Gunnar. Combined mold element and sealing ring. 4,061,459, Cl. 425-403.000.

Parris, Peter P.: *See*—
Jensen, Richard H.; and Parris, Peter P., 4,060,936, Cl. 49-465.000.

Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and by Schelkunova, Margarita Petrovna, administratrix. Installation for electroslag melting of heavy-weight metal ingots. 4,061,180, Cl. 164-252.000.

Pattison, Victor A.: *See*—
Maul, James J.; and Pattison, Victor A., 4,061,688, Cl. 260-651.00F.

Pawson, Beverly Ann: *See*—
Klaus, Michael Josef; and Pawson, Beverly Ann, 4,061,656, Cl. 260-332.20A.

Pech, Karl H., to Chandler Evans Inc. Impeller pump and vane pump assembly with clutch deactivation. 4,061,439, Cl. 415-18.000.

Pedestal Crane Corporation: *See*—
Goss, John B.; Morrow, William D.; and Corbett, Jack William, 4,061,230, Cl. 212-70.000.

Peed, Paul V. Wind driven electrical generator. 4,061,926, Cl. 290-55.000.

Pelletier, Ronald R.; Hansen, Robert D.; and Vanderbush, James J., to Dow Chemical Company, The. Latex coatings for electrographic sheets. 4,061,833, Cl. 428-511.000.

Peltier, Francois, to Moteurs Leroy-Somer. Method and a device for the automatic replacement of a workpiece to be machined on a machine-tool. 4,061,062, Cl. 82-2.700.

Pennsylvania Crusher Corporation: *See*—
Sautter, Daniel C., 4,061,279, Cl. 241-86.100.

Pennsylvania Engineering Corporation: *See*—
Fisher, Howard M., 4,061,318, Cl. 266-246.000.

Perkin-Elmer Limited: *See*—
Taylor, Leonard Harold, 4,062,021, Cl. 346-136.000.

Perkins, Donald W.; and Smith, Marvin W., to United States of America, Navy. Regulated power supply having a series arrangement of inverters. 4,062,057, Cl. 363-71.000.

Perkins, Gerard T. Fluid pressure sensing device. 4,061,034, Cl. 73-398.0AR.

Perrin, Rene: *See*—
Coulon, Andre; and Perrin, Rene, 4,060,883, Cl. 29-156.80R.

Perry, Gary D.: *See*—
Lowder, James E.; and Perry, Gary D., 4,061,392, Cl. 296-28.00C.

Peterson, Philip R.; Taylor, David W.; and Levijoki, Wayne A., to General Motors Corporation. Wheel lock control system failure and disabling circuit. 4,061,402, Cl. 303-92.000.

Peterson, Philip R.; and Taylor, David W., to General Motors Corporation. Wheel lock control system. 4,061,403, Cl. 303-106.000.

Petras, Raymond J.; and Groff, Gaylord L., to Minnesota Mining and Manufacturing Company. Flame-retardant pressure-sensitive adhesive composition. 4,061,826, Cl. 428-356.000.

Petrelis, Peter G., to TRW Inc. Redundancy switching system. 4,061,989, Cl. 333-7.00R.

Petrell, Jurgen: *See*—
Schallus, Erich; Mietens, Gerhard; Fucker, Gregor; Petrell, Jurgen; and Dorn, Friedrich Wilhelm, 4,061,719, Cl. 423-445.000.

Petro-Tex Chemical Corporation: *See*—
Edmondson, Morris S., 4,061,850, Cl. 526-220.000.

Petrocci, Alfonso N.: *See*—
Lada, Arnold; Petrocci, Alfonso N.; Green, Harold A.; and Merianos, John J., 4,061,750, Cl. 424-249.000.

Petrov, Georgy Nikolaevich: *See*—
Lifshits, Viktor Senderovich; Petrov, Georgy Nikolaevich; Papkov, Oleg Sergeevich; Khomenko, Vladimir Ivanovich; Gerasimenko, Alexandr Yakovlevich; Taradaiko, Alexandr Korneevich; Zemchenko, Alexandr Mikhailovich; and Gremyakov, Ivan Petrovich, 4,061,078, Cl. 90-24.00C.

Pettitt, George F. Tool for the insertion of thumb tacks. 4,061,225, Cl. 206-230.000.

Peyer, Siegfried: *See*—
Schwartz, Hermann, 4,060,965, Cl. 57-34.00R.

Pfeifer, Josef; Rheude, Alfred; and Muller, Jurgen, to AGFA-Gevaert Aktiengesellschaft. Method and apparatus for making X-ray images. 4,061,915, Cl. 250-315.00A.

Pfeifer, Wolf-Dieter: *See*—
Asinger, Friedrich; Pfeifer, Wolf-Dieter; Offermanns, Heribert; Scherberich, Paul; and Schreyer, Gerd, 4,061,674, Cl. 260-534.00S.

Phillips, Kenneth G.: *See*—
Tai, Wun Ten; Mura, Lawrence A.; Phillips, Kenneth G.; and Ballweber, Edward G., 4,061,695, Cl. 260-929.000.

Phillips Petroleum Company: *See*—
Austin, Oliver K., 4,061,316, Cl. 366-303.000.
Brown, James D.; and Uraneck, Carl A., 4,061,638, Cl. 260-270.00P.

Phillips, Raymond Francis, to Magnesium Elektron Limited. Preparation of ammonium and potassium zirconium carbonates. 4,061,720, Cl. 423-265.000.

Phillips, William W., to Shaymar, Inc. Speaker system. 4,061,877, Cl. 179-1.00E.

Pierce Chemical Company: *See*—
Oliver, Roy; and Royer, Garfield P., 4,061,591, Cl. 252-430.000.

Pieroh, Ernst Albrecht: *See*—
Nusslein, Ludwig; Pieroh, Ernst Albrecht; and Roder, Kurt, 4,061,645, Cl. 260-302.0SD.

Pigeon, Michel, to Commissariat a l'Energie Atomique. Process of and apparatus for non-destructive eddy current testing involves the suppression of displayed lobes corresponding to fault parameters to be eliminated from the display. 4,061,968, Cl. 324-40.000.

Pilvet, Aksel. Key operated lock. 4,061,003, Cl. 70-352.000.

Pinchot, Gifford, III. Hydrofoil vessel. 4,061,104, Cl. 114-281.000.

Pinto, Albert A.; and Stanley, Alexander J., to Nabisco, Inc. Machine for erecting folded cartons. 4,061,081, Cl. 93-53.0SD.

Piotrowski, Herbert: *See*—
Rothgordt, Ulf; Ehlers, Bernd; Bunge, Ernst; and Piotrowski, Herbert, 4,062,014, Cl. 340-347.0DD.

Pippin, Jack M.: *See*—
Cox, James L.; and Pippin, Jack M., 4,061,154, Cl. 135-34.000.

Pitney-Bowes, Inc.: *See*—
Swaniger, James R.; and Schubert, Keith E., 4,061,044, Cl. 74-31.000.

Pittman, Max G.: *See*—
Frye, Burton L.; Pittman, Max G.; Runge, David A.; Souza, Lawrence C.; and LaVoie, Raymond V., 4,061,480, Cl. 55-356.000.

Plasticolor Molded Products, Inc.: *See*—
Bagne, Gordon, 4,061,352, Cl. 280-154.50R.

Plessey Handel und Investments A.G.: *See*—
Stewart, William James, 4,061,416, Cl. 350-96.00C.

Ploix, Jean Luc: *See*—
Raverdy, Yvan; and Ploix, Jean Luc, 4,062,009, Cl. 340-324.00R.

Plum, Hans: *See*—
Arndt, Friedrich; and Plum, Hans, 4,061,491, Cl. 71-92.000.

Poensgen, Rudolf, to Siemens Aktiengesellschaft. Liquid-crystal display with polarizer, and method of making the same. 4,061,418, Cl. 350-160.0LC.

Pohl, Hanns: *See*—
Kahr, Kurt; Pohl, Hanns; Rapp, Guenther; and Lauz, Peter, 4,061,677, Cl. 260-566.00A.

Poisson, Regis: *See*—
Michel, Max; and Poisson, Regis, 4,061,594, Cl. 252-462.000.

Polaroid Corporation: *See*—
Idelson, Elbert M., 4,061,654, Cl. 260-314.500.

Politycki, Alfred, to Siemens Aktiengesellschaft. Method and masking structure for configurating thin layers. 4,061,814, Cl. 428-196.000.

Pomerantzeff, Oleg, to Retina Foundation. Illumination system for ophthalmoscope. 4,061,423, Cl. 351-16.000.

Pommer, Wayne A. Test instrument for determining apparent power consumption and ground faults in various portions of a distributed-load, constant voltage audio distribution system. 4,061,891, Cl. 179-175.10A.

Poole, Robert E. J., Jr., to Upjohn Company, The. Novel compositions. 4,061,815, Cl. 428-215.000.

Poppe, Wassily; and Fielding, Ivor R., to Standard Oil Company (Indiana). Process of forming a polypropylene coated substrate from an aqueous suspension of polypropylene particles. 4,061,835, Cl. 428-522.000.

Porter, William C.: *See*—
Bott, Gerald J.; Porter, William C.; and Nowak, Terrance M., 4,061,014, Cl. 73-45.100.

Poschel, Bruno P. H.: *See*—
Hastings, Stephen G.; Poschel, Bruno P. H.; and Butler, Donald E., 4,061,756, Cl. 424-263.000.

Pospisil, Frantisek; and Sedlak, Vaclav, to Adamovske strojirny, narodni podnik. Cylinders and rollers for printing machines. 4,060,882, Cl. 29-132.000.

Post, Rodney Morris: *See*—
Lang, Robert S.; Post, Rodney Morris; and Hogan, Thomas Leo, 4,060,946, Cl. 52-169.700.

Powell, James D.: *See*—
United States of America, National Aeronautics and Space Administration; Wynveen, Richard A.; Powell, James D.; and Schubert, Franz H., 4,061,570, Cl. 210-96.00M.

Powell, James E., to Shell Oil Company. 5,6-Dihydro-4H-1,3-thiazine-2-carboxaldehyde oxime useful as insecticides. 4,061,749, Cl. 424-246.000.

Powers, Thomas V., Jr., to Owens-Corning Fiberglas Corporation. Method and apparatus for packaging linear material. 4,061,285, Cl. 242-18.00R.

PPG Industries, Inc.: *See*—
Barter, James A., 4,061,704, Cl. 264-83.000.
Greenberg, Charles B., 4,061,830, Cl. 428-469.000.
Strong, W. Albert, 4,061,721, Cl. 423-272.000.

Prather, Joseph E.; and Khalifa, Ramzi A., to Edson Tool & Manufacturing Company, Inc. Self-locking devices. 4,061,371, Cl. 292-198.000.

Pratt, Norman Leslie; and Davies, Michael Bowen. Laser machining. 4,062,046, Cl. 358-93.000.

Precision Metalsmiths, Inc.: *See*—
Watts, Claude H., 4,061,175, Cl. 164-45.000.

Predhome, Wilfred F., Jr. Valve train for internal combustion engine. 4,061,115, Cl. 123-90.160.

Preier, Horst; and Riedel, Wolfgang. Measurement of low concentration gases. 4,061,918, Cl. 250-343.000.

Preston, Glenn W.; Chudleigh, Walter H., Jr.; and Ehrich, William G., to Control Data Corporation. MTI System processor and method. 4,062,011, Cl. 343-7.00A.

Preuss, Friedrich, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Auxiliary pile board assembly for printing presses. 4,061,086, Cl. 101-240.000.
Price, Bruce D. Kaleidoscopic apparatus. 4,061,414, Cl. 350-4.000.
Price, Charles Dan: *See—*
Goldstein, Marvin Sherwood; Lindsley, John Francis; Allison, William Woodrow; and Price, Charles Dan, 4,061,597, Cl. 252-465.000.
Price, Donald R.: *See—*
Zall, Robert R.; Sobel, A. Theodore; and Price, Donald R., 4,061,504, Cl. 134-95.000.
Price, Edgar Elmer; and Spurles, Louise Leone, to Xerox Corporation. Variable magnification lens system. 4,061,419, Cl. 350-184.000.
Price, Herbert Benjamin, to Spencer Wright Industries, Inc. Means for mounting tufting machine hooks and knives. 4,061,095, Cl. 112-79.00R.
Procter & Gamble Company, The: *See—*
Brush, John B., 4,061,063, Cl. 83-55.000.
DesMarais, Thomas A., 4,061,145, Cl. 128-275.000.
Youngquist, Rudolph William, 4,061,784, Cl. 426-93.000.
Proctor & Schwartz, Inc.: *See—*
Hoffman, Charles E., 4,060,914, Cl. 34-219.000.
Proebsting, Robert J.; and Schroeder, Paul R., to Mostek Corporation. Dynamic random access memory system. 4,061,954, Cl. 320-1.000.
Proebsting, Robert J.; and Schroeder, Paul R., to Mostek Corporation. Dynamic random access memory system. 4,061,999, Cl. 365-182.000.
Proebsting, Robert J.: *See—*
Schroeder, Paul R.; and Proebsting, Robert J., 4,061,933, Cl. 307-262.000.
Proost en Brandt N.V.: *See—*
Mulder, Franciscus Elbertus, 4,061,456, Cl. 425-140.000.
Protective Treatments, Inc.: *See—*
Thompson, James Thomas; and Seto, Kenneth Hon, 4,061,805, Cl. 428-31.000.
Proudman, Donald Lewis. Apparatus for folding flatwork. 4,061,326, Cl. 270-69.000.
Pryor, Joseph E., to Austin Industries, Inc. Lock and lift mechanism for a foldable implement. 4,061,195, Cl. 172-456.000.
Przedsiebiorstwo Projektowania i Wyposazania Zakladow Przemyslu Maszyn i Aparatow Ekejtrtczbtcg "Promel": *See—*
Ficek, Jan, 4,061,181, Cl. 164-292.000.
Quadracast Systems, Inc.: *See—*
Dorren, Louis, 4,061,882, Cl. 179-15.0BT.
Quast, Kenneth J., to Bard Laboratories, Inc. Thermal recording system. 4,061,831, Cl. 428-480.000.
Questar Corporation: *See—*
Kaprelian, Edward K.; and Mimmack, William E., 4,061,420, Cl. 350-199.000.
Quinn, Edwin John: *See—*
Dieck, Ronald Lee; and Quinn, Edwin John, 4,061,606, Cl. 260-2.50R.
R. J. Reynolds Tobacco Company: *See—*
Lee, Chin Kee, 4,061,539, Cl. 195-31.00F.
Rackard, Troy D.; and Snider, Grover E., to National Gypsum Company. Concealed clip for hollow strips. 4,060,950, Cl. 52-456.000.
Raczkowski, Mark Bogdan. Ash tray with smoke exhauster. 4,061,149, Cl. 131-231.000.
Radcliffe, Richard J., to EBCO Manufacturing Company. Heat exchanger for a refrigerated water cooler. 4,061,184, Cl. 165-38.000.
Railweight Inc. (U.K.) Limited: *See—*
Caldicott, Jack Richard, 4,061,198, Cl. 177-50.000.
Raisbeck, Wesley Paul; Bass, Merlyn Duane; Whicker, Bobbie Dean; Davis, William Clair; and Fairbank, Raymond Harry, to Deere & Company. Harvester cutterhead. 4,061,284, Cl. 241-294.000.
Rajasekaran, Ramanujam; Taylor, Dennis O.; and Whittlesey, James W., to Cummins Engine Company, Inc. Dual cooling system. 4,061,187, Cl. 165-107.000.
Ramaglia, Michael: *See—*
Warshaw, Saul; Loveland, Winton; Hanemann, Horst J.; and Ramaglia, Michael, 4,061,526, Cl. 156-468.000.
Randall, Lee S. Locker system. 4,061,379, Cl. 312-201.000.
Randle, Raymond Thomas, to Steetley (Mfg.) Limited. Filtration apparatus. 4,061,575, Cl. 210-350.000.
Ranks Hovis McDougall Limited: *See—*
Solomons, Gerald L.; and Scammell, Gerald W., 4,061,781, Cl. 426-60.000.
Rapp, Guenther: *See—*
Kahr, Kurt; Pohl, Hanns; Rapp, Guenther; and Lauz, Peter, 4,061,677, Cl. 260-566.00A.
Rappleyea, Frederick A., to Kendall Company, The. Pad for protective helmet. 4,060,855, Cl. 2-413.000.
Rasmussen, Harry R., to Crest Industries, Inc. Control unit mounting and interconnecting apparatus for telephone sets. 4,061,888, Cl. 179-100.00D.
Rath, Heinrich Bernard: *See—*
Gee, David William; Klassen, Horst Willi; and Rath, Heinrich Bernard, 4,061,209, Cl. 188-73.300.
Ratier-Forest: *See—*
Belliere, Pierre A., 4,061,440, Cl. 416-157.00R.
Raverdy, Yvan; and Ploix, Jean Luc, to Thomson-CSF. Electrophoretic display device. 4,062,009, Cl. 340-324.00R.
Ray-Chaudhuri, Dilip K.: *See—*
Stanley, Henry; and Ray-Chaudhuri, Dilip K., 4,061,618, Cl. 260-29.2TN.
Raymond Lee Organization, Inc., The: *See—*
Arriola, Baltazar, 4,061,065, Cl. 83-562.000.
Bryerton, John B., 4,060,871, Cl. 15-29.000.
Lo, Kenneth K., 4,061,293, Cl. 244-26.000.
Raynaud, Guy R.: *See—*
Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy R.; and Gouret, Claude J., 4,061,855, Cl. 544-122.000.
RCA Corporation: *See—*
Ahmed, Adel Abdel Aziz, 4,061,959, Cl. 323-1.000.
Goldman, Abraham; and Datta, Pabitra, 4,061,529, Cl. 156-644.000.
Miyatani, Kazuo; and Sato, Isao, 4,061,555, Cl. 204-242.000.
Neilson, John Manning Savidge, 4,062,032, Cl. 357-13.000.
Stewart, Roger Green, 4,061,962, Cl. 323-22.00R.
Woodward, Oakley McDonald; and Siukola, Matti Solmu Olavi, 4,062,019, Cl. 343-797.000.
Recognition Equipment Incorporated: *See—*
Carnahan, Joe B.; and Koenig, Robert B., 4,061,380, Cl. 339-8.00R.
Redimix Beverages Limited: *See—*
Baxter, Gerald M., 4,061,782, Cl. 426-86.000.
Redken Laboratories, Inc.: *See—*
Murray, John S.; and Sunjara, Sime, 4,061,898, Cl. 219-211.000.
Yates, Robert W., 4,061,022, Cl. 73-95.000.
Redman, Andrew Paul: *See—*
Dunn, James Knox, III; Tucker, Lee Everett; and Redman, Andrew Paul, 4,061,167, Cl. 144-34.00E.
Reed, David H.: *See—*
George, Jay R.; Line, Larry L.; and Reed, David H., 4,061,516, Cl. 156-94.000.
Reese, Olen Dennis. Sub-surface irrigation method and apparatus. 4,060,991, Cl. 61-13.000.
Reflectolite Products Inc.: *See—*
Hauber, Peter Fritz, 4,061,370, Cl. 292-175.000.
Reggers, Charles Gerardus, to Delta Plastics Limited. Animal identification tag. 4,060,922, Cl. 40-302.000.
Reida, William D., to AMI Industries, Inc. Tie down for rotating seat cushions. 4,061,396, Cl. 297-283.000.
Reimers, Fred Alan; Beckmann, Robert Martin; Burzynski, William Arthur; Tomlinson, Dennis Eugene; and Schwartz, William Henry, to Motorola, Inc. Synthesizer. 4,061,973, Cl. 325-17.000.
Reinermann, Karl-Heinz: *See—*
Sistig, Eberhard; and Reinermann, Karl-Heinz, 4,061,848, Cl. 526-61.000.
Reis, August; Fend, Fritz; and Hils, Karl, to Sachs-Systemtechnik GmbH. Portable electrolytic apparatus for purifying drinking water. 4,061,556, Cl. 204-271.000.
Rembaum, Alan: *See—*
Hadek, Vaclav; Somoano, Robert B.; and Rembaum, Alan, 4,061,834, Cl. 428-522.000.
Retelny, Andrew G., to McDonald's Corporation. Food plate package. 4,061,241, Cl. 220-4.00B.
Retina Foundation: *See—*
Pomerantzeff, Oleg, 4,061,423, Cl. 351-16.000.
Revell, Alan E., to American Air Filter Company, Inc. Door latch device. 4,061,373, Cl. 292-251.000.
Rey, Hans-Georg: *See—*
Lange, Hans; Rittersdorf, Walter; Rey, Hans-Georg; Werner, Wolfgang; and Rieckmann, Peter, 4,061,468, Cl. 23-253.0TP.
Rheude, Alfred: *See—*
Pfeifer, Josef; Rheude, Alfred; and Muller, Jurgen, 4,061,915, Cl. 250-315.00A.
Rhone-Poulenc Industries: *See—*
Mazarguil, Honore; Meiller, Francois; and Monsan, Pierre, 4,061,828, Cl. 428-403.000.
Michel, Max; and Poisson, Regis, 4,061,594, Cl. 252-462.000.
Rhone-Poulenc-Textile: *See—*
Couchoud, Paul, 4,061,615, Cl. 260-45.70P.
Rhone-Poulenc Textiles: *See—*
Barbe, Gerard; and Deyres, Andre, 4,060,968, Cl. 57-140.0BY.
Rhone Progil: *See—*
Leleu, Gerard; Bedague, Pierre; and Sillion, Bernard, 4,061,581, Cl. 252-32.70E.
Ricards, Charles R.: *See—*
Decker, John J.; and Ricards, Charles R., 4,061,163, Cl. 141-7.000.
Riccio, Pasquale R., to Ciba-Geigy Corporation. Aerosol dispenser using butane propellant. 4,061,252, Cl. 222-402.180.
Riccitiello, Salvatore R.: *See—*
Sawko, Paul M.; and Riccitiello, Salvatore R., 4,061,579, Cl. 252-8.100.
Rice, George A.: *See—*
Girard, Roland T.; and Rice, George A., 4,061,584, Cl. 252-63.000.
Richard Heinze: *See—*
Busse, Peter, 4,060,949, Cl. 52-285.000.
Richardson, James L., to Veda, Inc. Tank spreader. 4,061,273, Cl. 239-172.000.
Richardson-Merrell Inc.: *See—*
Blohm, Thomas R.; Grisar, J. Martin; and Wiech, Norbert L., 4,061,746, Cl. 424-244.000.
Richmond Industries, Inc.: *See—*
Allmendinger, Norbert, 4,061,507, Cl. 148-12.00R.
Richter, Manfred: *See—*
Schafer, Werner; Busch, Wolfram; Wallhausser, Hermann; Richter, Manfred; and Wilhelm, Siegfried, 4,061,710, Cl. 264-300.000.
Ricoh Co., Ltd.: *See—*
Fujimoto, Sakae; Sue, Takaji; and Misawa, Toshihiko, 4,061,328, Cl. 271-10.000.
Yanagawa, Nobuyuki, 4,061,330, Cl. 271-174.000.
Riddle, Neville L.: *See—*
Kitchen, John P.; and Riddle, Neville L., 4,060,862, Cl. 5-260.000.

Ridgway, Bryan George, to Rolls-Royce Motors Limited. Apparatus for retracting a retractable protrusion. 4,061,303, Cl. 248-204.000.
Rieckmann, Peter: *See—*
Lange, Hans; Rittersdorf, Walter; Rey, Hans-Georg; Werner, Wolfgang; and Rieckmann, Peter, 4,061,468, Cl. 23-253.0TP.
Riedel, Wolfgang: *See—*
Preier, Horst; and Riedel, Wolfgang, 4,061,918, Cl. 250-343.000.
Rieter Machine Works, Ltd.: *See—*
Lamparter, Hansruedi, 4,061,948, Cl. 318-87.000.
Rimmel, Carl F., to Owens-Corning Fiberglas Corporation. Method of and apparatus for controlling the distribution of fibers on a receiving surface. 4,061,485, Cl. 65-4.00R.
Rinehart, Michael G.: *See—*
Schmidt, Ernest J., Jr.; Rinehart, Michael G.; and Blevins, Bascom D., 4,061,350, Cl. 280-87.04A.
Rittersdorf, Walter: *See—*
Lange, Hans; Rittersdorf, Walter; Rey, Hans-Georg; Werner, Wolfgang; and Rieckmann, Peter, 4,061,468, Cl. 23-253.0TP.
Roantree, James P.; and Swartzentruber, Glenn A., to United Technologies Corporation. Dual range, torque rebalancing of inertial sensor. 4,062,004, Cl. 340-187.000.
Robert, Andre, to Upjohn Company, The. Method of reducing the undesirable gastrointestinal effects of prostaglandin synthetase inhibitors with PGA compounds. 4,061,742, Cl. 424-234.000.
Robert Bosch G.m.b.H.: *See—*
Brakel, Kornelius, 4,061,159, Cl. 137-596.000.
Heizmann, Frieder, 4,060,906, Cl. 33-181.00R.
Sopha, Klaus, 4,061,155, Cl. 137-85.000.
Roberts, Edward D., to U.S. Philips Corporation. Positive-working electron resists. 4,061,832, Cl. 428-500.000.
Robertson, Donald A., to Indexomatic, Inc. Milling cutter. 4,061,076, Cl. 90-11.00A.
Robinson, Graham: *See—*
Jones, Ivor Wynn; Robinson, Graham; and Bird, Thomas Lewis, 4,061,840, Cl. 429-104.000.
Robinson, Owen R. Animal ear tag. 4,060,921, Cl. 40-301.000.
Robinson, Walter L. Pneumatic aquatic device. 4,060,866, Cl. 9-310.00D.
Rochat, Daniel, to Ebauches S.A. Timepiece. 4,060,977, Cl. 58-85.500.
Rockefeller, Winston C., to Colgate-Palmolive Company. Metering dispensing bottle. 4,061,253, Cl. 222-442.000.
Rockwell International Corporation: *See—*
George, Peter K., 4,062,003, Cl. 365-16.000.
Rockwell-Rimoldi S.p.A.: *See—*
Marforio, Nerino, 4,061,097, Cl. 112-121.150.
Rodeman, Donald W.: *See—*
Endres, Thomas E.; and Rodeman, Donald W., 4,061,981, Cl. 325-419.000.
Roder, Kurt: *See—*
Nusslein, Ludwig; Pieroh, Ernst Albrecht; and Roder, Kurt, 4,061,645, Cl. 260-302.0SD.
Rody, Jean, to Ciba-Geigy Corporation. 1-Aza-4-thiacyclohexane-4,4-dioxide derivatives. 4,061,631, Cl. 544-53.000.
Roffia, Paolo: *See—*
Fumagalli, Carlo; Caprara, Giuseppe; and Roffia, Paolo, 4,061,868, Cl. 560-246.000.
Rohm and Haas Company: *See—*
Brodnyan, John G.; Holloway, Donald F.; and Le Sota, Stanley, 4,061,822, Cl. 428-315.000.
Rohr Industries, Incorporated: *See—*
Nerem, Arne, 4,061,930, Cl. 307-254.000.
Roland Offsetmaschinenfabrik Faber & Schleicher AG.: *See—*
Preuss, Friedrich, 4,061,086, Cl. 101-240.000.
Rollmann, Louis D.: *See—*
Kerr, George T.; and Rollmann, Louis D., 4,061,717, Cl. 423-329.000.
Rolls-Royce Motors Limited: *See—*
Ridgway, Bryan George, 4,061,303, Cl. 248-204.000.
Rolm Corporation: *See—*
Kasson, James M.; and Wood, Samuel F., 4,061,887, Cl. 179-99.000.
Romanyszyn, Michael Taras, Jr.: *See—*
Lindler, James Monroe; and Romanyszyn, Michael Taras, Jr., 4,061,806, Cl. 428-35.000.
Rose, Carl John: *See—*
Lake, Anthony William; and Rose, Carl John, 4,061,779, Cl. 424-331.000.
Rose, Thomas J.: *See—*
Schmanski, Donald W.; and Rose, Thomas J., 4,061,435, Cl. 404-10.000.
Rosenberg, Robert: *See—*
Cuomo, Jerome John; DiStefano, Thomas Herman; and Rosenberg, Robert, 4,062,038, Cl. 357-30.000.
Rosenberg, William E., to Columbia Chemical Corporation. Acidic plating bath and additives for electrodeposition of bright tin. 4,061,547, Cl. 204-54.00R.
Rosenfeld, Steven Allen, to Magidoff, Barry G., a part interest. Luminescent jewelry. 4,061,910, Cl. 362-34.000.
Ross, Joseph D. Collapsible lamp shade frame. 4,061,913, Cl. 362-357.000.
Rothenberg, Sidney; and Vostovich, Joseph Edward, to General Electric Company. Method of patching voids in a semi-conductive component of insulated electric cable, and compound therefor. 4,061,703, Cl. 264-36.000.
Rothgordt, Ulf; Ehlers, Bernd; Bunge, Ernst; and Piotrowski, Herbert, to U.S. Philips Corporation. Natural binary to logarithmic binary conversion device with means for range selection. 4,062,014, Cl. 340-347.0DD.
Rotocrop International, Ltd.: *See—*
Wilson, Clifford Arthur, 4,060,945, Cl. 52-169.500.
Roussel Uclaf: *See—*
Martel, Jacques; Buendia, Jean; and Vivat, Michel, 4,061,729, Cl. 424-305.000.
Rowe-DeArmond, Inc.: *See—*
Rowe, Horace N., 4,061,934, Cl. 310-323.000.
Rowe, Horace N., to Rowe-DeArmond, Inc. Vibration pickup unit for sensing vibrations of musical instruments and the like. 4,061,934, Cl. 310-323.000.
Rowland, Stanley P.: *See—*
Franklin, William E.; Madacsi, John P.; and Rowland, Stanley P., 4,061,465, Cl. 8-185.000.
Rowlandson, Lyall G.: *See—*
Hamid, Michael A.; and Rowlandson, Lyall G., 4,061,991, Cl. 333-22.00R.
Royer, Garfield P.: *See—*
Oliver, Roy; and Royer, Garfield P., 4,061,591, Cl. 252-430.000.
Rubinfeld, Joseph, to Colgate-Palmolive Company. Detergents. 4,061,603, Cl. 252-548.000.
Rudolph, Stephen Edward: *See—*
Glowaky, Raymond Charles; Rudolph, Stephen Edward; and Bierwagen, Gordon Paul, 4,061,610, Cl. 260-17.4ST.
Glowaky, Raymond Charles; Rudolph, Stephen Edward; and Bierwagen, Gordon Paul, 4,061,611, Cl. 260-17.4ST.
Runge, David A.: *See—*
Frye, Burton L.; Pittman, Max G.; Runge, David A.; Souza, Lawrence C.; and LaVoie, Raymond V., 4,061,480, Cl. 55-356.000.
Rushing, Allen J., to Eastman Kodak Company. Web tracking apparatus. 4,061,222, Cl. 198-807.000.
Rutgerswerke Aktiengesellschaft: *See—*
Schafer, Werner; Busch, Wolfram; Wallhausser, Hermann; Richter, Manfred; and Wilhelm, Siegfried, 4,061,710, Cl. 264-300.000.
Ryan, Arthur B.; and Thomas, Charles B., to Gleason Works, The. Cutter head assembly for gear cutting machines. 4,060,881, Cl. 407-22.000.
Rylewski, Eugeniusz M. Fluid rotating machines with spiral-like passages and vane wheels. 4,061,449, Cl. 418-226.000.
Ryu, Ji-Yong; and Germanas, Dalia, to UOP Inc. Process for the conversion of aromatic hydrocarbons. 4,061,689, Cl. 260-671.00R.
S.R.M. Hydromekanik Aktiebolag: *See—*
Ahlen, Karl Gustav, 4,061,207, Cl. 188-264.00E.
Saab-Scania Aktiebolag: *See—*
Nordstrom, Sigurd Andrew Mauritz, 4,061,377, Cl. 308-207.00R.
Sachs-Systemtechnik GmbH: *See—*
Reis, August; Fend, Fritz; and Hils, Karl, 4,061,556, Cl. 204-271.000.
Sachuk, Daniel B.; and Lane, Robert L., to Computer Peripherals, Inc. Offset card feed apparatus. 4,061,329, Cl. 271-10.000.
Saczawa, John S., Jr.: *See—*
Montgomery, James R.; and Saczawa, John S., Jr., 4,061,384, Cl. 293-71.00R.
Saida, Yoshinori; and Katoh, Kazumasa, to Nissan Motor Co., Ltd. Knock level control apparatus for an internal combustion engine. 4,061,116, Cl. 123-117.00D.
St. Clair, Paul J. Car rack for golf carts. 4,061,257, Cl. 224-42.080.
Saito, Masayasu. Underwater breathing device. 4,061,140, Cl. 128-145.00A.
Saito, Sadayuki: *See—*
Tanaka, Sadaharu; Saito, Sadayuki; and Hirano, Sensaburo, 4,061,319, Cl. 266-281.000.
Saito, Shunjiro; Aue, Kazuhide; and Shimojo, Nobuei, to TDK Electronics Co., Ltd. Electrode. 4,061,558, Cl. 204-290.00F.
Saitou, Tadashi: *See—*
Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, 4,061,446, Cl. 418-133.000.
Sakai, Toshimitsu: *See—*
Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, 4,061,446, Cl. 418-133.000.
Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, to Nippon Piston Ring Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary air pump or compressor with flexible end sealing plates. 4,061,446, Cl. 418-133.000.
Sakamoto, Teruo: *See—*
Sato, Fumio; Sakamoto, Teruo; Watashiro, Seiichi; Inoue, Hayao; and Yahata, Yoshihito, 4,061,164, Cl. 141-90.000.
Sakurada, Hikaru: *See—*
Matsushita, Kunichi; Sakurada, Hikaru; and Onuma, Kazuhiko, 4,061,596, Cl. 252-463.000.
Sakurada, Nobuaki: *See—*
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Mashaharu; and Shinoda, Nobuhiko, 4,062,022, Cl. 354-38.000.
Salensky, George Anthony: *See—*
Berger, Sidney Ethan; and Salensky, George Anthony, 4,061,503, Cl. 106-300.000.
Salman, Naif D.: *See—*
Motley, David M.; Salman, Naif D.; and Cheng, King Y., 4,061,978, Cl. 325-324.000.
Salmin, Valery Vasilievich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory

Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix. 4,061,180, Cl. 164-252.000.

Salomon, Georges Pierre Joseph. Safety arrangement for a ski. 4,061,356, Cl. 280-605.000.

Salomon, Georges Pierre Joseph. Ski binding having a releasable boot plate provided with a ski brake. 4,061,357, Cl. 280-605.000.

Samuel Moore and Company: *See*—
Snow, John P., 4,061,407, Cl. 339-75.00P.

Samuels, Peter B.; and Wood, Ernest C. Arterial graft device. 4,061,134, Cl. 128-1.00R.

Sandoz, Inc.: *See*—
Nadelson, Jeffrey, 4,061,778, Cl. 424-330.000.
Tuttle, Glenn L., 4,061,142, Cl. 128-214.00R.

Sandoz Ltd.: *See*—
Dorner, Friedrich; Scriba, Marianne; and Weil, Rudolf, 4,061,538, Cl. 195-29.000.
Kunzle, Franz Martin, 4,061,752, Cl. 424-250.000.

Sandring, Albert W., to Butler Manufacturing Company. Maintenance platform for a building roof. 4,060,944, Cl. 52-43.000.

Sandt, Clayton. Kinesitherapeutic bed structure. 4,061,137, Cl. 128-33.000.

Sanford Research Institute: *See*—
Taenzer, Jon C., 4,061,415, Cl. 350-6.000.

Sankyo Company Limited: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,061,616, Cl. 260-45.80N.

Sanner, George E. Sprinkler flow control systems having continuous cycle timer and associated apparatus disposed in a hermetically sealed housing. 4,061,893, Cl. 200-38.00D.

Sanshin Kagaku Kogyo Company, Limited: *See*—
Kawaoka, Yutaka; Kifune, Tatsuo; Teshima, Masahiko; and Koizumi, Tatsuya, 4,061,646, Cl. 260-306.000.

Sarantakis, Dimitrois, to American Home Products Corporation. Arg ^{4}-somatostatin and analogues thereof. 4,061,608, Cl. 260-8.000.

Sasaki, Hiromichi, to Kabushiki Kaisha Fuji Seisakusho. Data retrieving device. 4,060,919, Cl. 40-104.00A.

Sato, Fumio; Sakamoto, Teruo; Watashiro, Seiichi; Inoue, Hayao; and Yahata, Yoshihito, to Shionogi & Co., Ltd. Powder filling machine. 4,061,164, Cl. 141-90.000.

Sato, Isao: *See*—
Miyatani, Kazuo; and Sato, Isao, 4,061,555, Cl. 204-242.000.

Sato, Tsutomu, to Sony Corporation. Radio receiver with plural converters and frequency control. 4,061,980, Cl. 325-419.000.

Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Composite label strip for use with label applying apparatus. 4,061,808, Cl. 428-42.000.

Satzinger, Gerhard; and Herrmann, Manfred Franz, to Warner-Lambert Company. Process for the preparation of 1-phenyl-4-aminocyclohex-2-ene-1-carboxylic acid esters and the salts thereof. 4,061,635, Cl. 544-172.000.

Saunders, Jim G.; and Stucki, Alfred B., to Thiokol Corporation. Telemetering system. 4,061,901, Cl. 235-92.0EV.

Sauter, Richard. Dowel pin with socket for the manufacture of dowel models in dental technology. 4,060,899, Cl. 32-11.000.

Sautter, Daniel C., to Pennsylvania Crusher Corporation. High-speed rotating crushing machinery. 4,061,279, Cl. 241-86.100.

Sawase, Yoko: *See*—
Sugimoto, Isao; and Sawase, Yoko, 4,061,744, Cl. 424-243.000.

Sawko, Paul M.; and Riccitiello, Salvatore R., to United States of America, National Aeronautics and Space Administration. Intumescent coatings containing 4,4'-dinitrosulfanilide. 4,061,579, Cl. 252-8.100.

Sawyer, Elbert Morgan. Personal rapid transit system. 4,061,089, Cl. 104-23.0FS.

Say, Donald L.: *See*—
Hallett, Joseph L.; and Say, Donald L., 4,061,941, Cl. 313-414.000.

Scaggs, Lee E.: *See*—
Tallent, Michael W.; Scaggs, Lee E.; Swain, Allan L.; Harrison, Ronnie M.; and Hendershot, William B., III, 4,062,041, Cl. 358-8.000.

Scammell, Gerald W.: *See*—
Solomons, Gerald L.; and Scammell, Gerald W., 4,061,781, Cl. 426-60.000.

Schaaf, Siegfried, to Inventa AG fur Forschung und Patentverwertung. Copolyamide dispersions and methods of making and using same. 4,061,619, Cl. 260-29.20N.

Schafer, Werner; Busch, Wolfram; Wallhausser, Hermann; Richter, Manfred; and Wilhelm, Siegfried, to Rutgerswerke Aktiengesellschaft. Molded articles. 4,061,710, Cl. 264-300.000.

Schall, Roger, to Lohr-Construction de Vehicules Industriels S.A. Elevating assembly for the upper platform of a road transport vehicle carrier. 4,061,390, Cl. 296-1.00A.

Schallus, Erich; Mietens, Gerhard; Fucker, Gregor; Petrell, Jurgen; and Dorn, Friedrich Wilhelm, to Hoechst Aktiengesellschaft. Process of conductive carbon black for use in depolarization masses in dry batteries. 4,061,719, Cl. 423-445.000.

Schamper, Thomas J.: *See*—
Dasher, George F.; O'Cull, Kathleen A.; and Schamper, Thomas J., 4,061,150, Cl. 132-7.000.

Schattmaier, Kurt, to Contraves AG. Surgical chair for a doctor. 4,061,304, Cl. 248-404.000.

Schaub, Robert Eugene: *See*—
Floyd, Middleton Brawner, Jr.; McGahren, William James; Schaub, Robert Eugene; and Weiss, Martin Joseph, 4,061,672, Cl. 260-514.00D.

Schelkunov, Jury Andreevich, deceased: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix. 4,061,180, Cl. 164-252.000.

Schelkunova, Margarita Petrovna, administratrix: *See*—
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.

Scherberich, Paul: *See*—
Asinger, Friedrich; Pfeifer, Wolf-Dieter; Offermanns, Heribert; Scherberich, Paul; and Schreyer, Gerd, 4,061,674, Cl. 260-534.00S.

Schering Aktiengesellschaft: *See*—
Arndt, Friedrich; and Plum, Hans, 4,061,491, Cl. 71-92.000.
Nusslein, Ludwig; Pieroh, Ernst Albrecht; and Roder, Kurt, 4,061,645, Cl. 260-302.0SD.
Wiechert, Rudolf; Kerb, Ulrich; and Engelfried, Otto, 4,061,661, Cl. 260-397.450.

Scherrer, Hanspeter; and Boller, Arthur, to Hoffmann-La Roche Inc. Liquid crystalline cinnamic acid esters. 4,061,587, Cl. 252-299.000.

Schick, Jean-Francois, to Societe Goro. Fastener for conveyor belts or bands. 4,060,877, Cl. 24-33.00B.

Schlangen, Ronald F. Ceramic tile cutting apparatus. 4,061,126, Cl. 125-21.000.

Schlapfer, Hans: *See*—
Kormany, Geza; Kabas, Guglielmo; Schlapfer, Hans; and Siegrist, Adolf Emil, 4,061,860, Cl. 542-462.000.

Schlegel Engineering GmbH: *See*—
Hammer, Heiner I., 4,061,519, Cl. 156-244.000.

Schleppnik, Alfred A., to Monsanto Company. Cis-2-methyl-oct-5-en-2-yl acetate. 4,061,667, Cl. 560-261.000.

Schmader, Richard W. Input section of apparatus for use in the continuous production of doughnuts. 4,061,314, Cl. 366-145.000.

Schmanski, Donald W.; and Rose, Thomas J. Roadway delineator. 4,061,435, Cl. 404-10.000.

Schmidt, Ernest J., Jr.; Rinehart, Michael G.; and Blevins, Bascom D., to Dayco Corporation. Skateboard. 4,061,350, Cl. 280-87.04A.

Schmitz, Louis S. Minnow dipper. 4,060,923, Cl. 43-4.000.

Schneehage, Hans Henning: *See*—
Ohlinger, Manfred; Schoenafinger, Eduard; Vaeth, Guenter; Stritzinger, Heinz; Koester, Eberhard; Schneehage, Hans Henning; and Steck, Werner, 4,061,726, Cl. 423-634.000.

Schneerson, Moshe. Apparatus for removing drinking straws from bottles. 4,061,236, Cl. 214-309.000.

Schneider, Hans: *See*—
Weiler, Herbert; Schneider, Hans; Von Janecek, Wolfgang; and Weyrich, Ludwin, 4,060,911, Cl. 34-5.000.

Schneider, Horst: *See*—
Mundus, Friedhelm; and Schneider, Horst, 4,061,458, Cl. 425-392.000.

Schneider, Walter: *See*—
Ohlinger, Manfred; Schoenafinger, Eduard; Schneider, Walter; Stritzinger, Heinz; and Vaeth, Guenter, 4,061,725, Cl. 423-634.000.

Schoenafinger, Eduard: *See*—
Ohlinger, Manfred; Schoenafinger, Eduard; Schneider, Walter; Stritzinger, Heinz; and Vaeth, Guenter, 4,061,725, Cl. 423-634.000.
Ohlinger, Manfred; Schoenafinger, Eduard; Vaeth, Guenter; Stritzinger, Heinz; Koester, Eberhard; Schneehage, Hans Henning; and Steck, Werner, 4,061,726, Cl. 423-634.000.
Vaeth, Guenter; Ohlinger, Manfred; Stritzinger, Heinz; Schoenafinger, Eduard; Wettstein, Eugen; and Guth, Wolfgang, 4,061,727, Cl. 423-634.000.

Scholkens, Bernward: *See*—
Bartmann, Wilhelm; Kunstmann, Rudolf; Lerch, Ulrich; and Scholkens, Bernward, 4,061,766, Cl. 424-279.000.

Schreurs, Willy P., to GTE Sylvania Incorporated. Fluorescent lamp having zero back brightness. 4,061,946, Cl. 313-488.000.

Schreyer, Gerd: *See*—
Asinger, Friedrich; Pfeifer, Wolf-Dieter; Offermanns, Heribert; Scherberich, Paul; and Schreyer, Gerd, 4,061,674, Cl. 260-534.00S.

Schroeder, Paul R.; and Proebsting, Robert J., to Mostek Corporation. Clock generator and delay stage. 4,061,933, Cl. 307-262.000.

Schroeder, Paul R.: *See*—
Proebsting, Robert J.; and Schroeder, Paul R., 4,061,954, Cl. 320-1.000.

Proebsting, Robert J.; and Schroeder, Paul R., 4,061,999, Cl. 365-182.000.

Schroeter, Siegfried H.; and Olson, Daniel R., to General Electric Company. Urethanes of hydroxybenzotriazoles. 4,061,652, Cl. 260-308.00B.

Schroter, Herbert, to Hoechst Aktiengesellschaft. Apparatus for producing a developer medium for diazotype materials. 4,062,031, Cl. 354-299.000.

Schubert, Franz H.: *See—*
United States of America, National Aeronautics and Space Administration; Wynveen, Richard A.; Powell, James D.; and Schubert, Franz H., 4,061,570, Cl. 210-96.00M.

Schubert, Keith E.: *See—*
Swaniger, James R.; and Schubert, Keith E., 4,061,044, Cl. 74-31.000.

Schultz, William J.; and Smith, Samuel, to Minnesota Mining and Manufacturing Company. Process for prepolymers and products. 4,061,624, Cl. 260-79.30M.

Schupak, Grigory Bentsionovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.

Schwartz, Hermann, to Peyer, Siegfried. Method and apparatus to monitor thread spinning operation of open end spinning machines and effective thread stop motion. 4,060,965, Cl. 57-34.00R.

Schwartz, William Henry: *See—*
Reimers, Fred Alan; Beckmann, Robert Martin; Burzynski, William Arthur; Tomlinson, Dennis Eugene; and Schwartz, William Henry, 4,061,973, Cl. 325-17.000.

Schwartzberg, Abraham. Impact absorbing bumper. 4,061,385, Cl. 293-71.00P.

Schwarzbeck, Andreas Michael: *See—*
Seiler, Fritz; and Schwarzbeck, Andreas Michael, 4,061,537, Cl. 195-1.700.

Schwarze, Werner; Merk, Wolfgang; and Binder, Volker, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler; and Henkel U. Cie. Antistatic agent for thermoplastic synthetic resin. 4,061,869, Cl. 526-1.000.

Scott, Charles E., to P. R. Mallory & Co. Inc. Solid-state delay timed switching circuit. 4,062,007, Cl. 340-309.100.

Scott & Fetzer Co., The: *See—*
Woolley, Lee A., 4,061,936, Cl. 310-41.000.

Scriba, Marianne: *See—*
Dorner, Friedrich; Scriba, Marianne; and Weil, Rudolf, 4,061,538, Cl. 195-29.000.

Scull, Harvey Ronald, to Bell Telephone Laboratories, Incorporated. Apparatus for magnetic tape head alignment. 4,062,047, Cl. 360-26.000.

Sea Tank Co. S.A.: *See—*
Lacroix, Roger; and Lepere, Claude, 4,060,995, Cl. 61-92.000.

Seagull Industries, Inc.: *See—*
Biron, Richard D., 4,061,573, Cl. 210-282.000.

Sebulsky, Raynor T.: *See—*
McKinney, Joel Drexler; Sebulsky, Raynor T.; and Wynne, Francis Edmund, Jr., 4,061,562, Cl. 208-61.000.

Sedlacek, Pavel; and Hajek, Jiri, to Ceskoslovenska akademie ved. Method and apparatus for generating a continuous magnetic field determining the position of an inductive sensing element therein. 4,061,966, Cl. 324-207.000.

Sedlak, Vaclav: *See—*
Pospisil, Frantisek; and Sedlak, Vaclav, 4,060,882, Cl. 29-132.000.

Seiko Koki Kabushiki Kaisha: *See—*
Kitai, Kiyoshi; Nakamura, Yukio; Kato, Shogo; and Nagaoka, Shinji, 4,062,029, Cl. 354-232.000.

Seiler, Fritz; and Schwarzbeck, Andreas Michael, to Behringwerke Aktiengesellschaft. Polyionic isotonic salt solution. 4,061,537, Cl. 195-1.700.

Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See—*
Matsui, Takashi, 4,060,958, Cl. 53-37.000.

Sekiya, Fukuo: *See—*
Natori, Minoru; Hatuse, Toshikazu; Kawanobe, Kouhei; Ogawa, Hiroshi; Sekiya, Fukuo; Ebihara, Heihachiro; and Uchino, Misao, 4,060,974, Cl. 58-23.00R.

Self, James M., to H. H. Robertson Company. Semisolid polymerizable compositions, method of preparing the same and thermoset products thereof. 4,061,613, Cl. 260-40.00R.

Self, James M., to H. H. Robertson Company. Semisolid polymerizable compositions, method of preparing the same and thermoset products thereof. 4,061,614, Cl. 260-40.00R.

Selleri, Renato: *See—*
Orzalesi, Giovanni; and Selleri, Renato, 4,061,668, Cl. 260-500.50H.

Sellstedt, John H., to American Home Products Corporation. Intermediates for producing semi-synthetic penicillins and cephalosporins and methods of production. 4,061,628, Cl. 260-239.100.

Selman, Gordon Leslie; and Midgley, Richard John, to Johnson, Matthey & Co., Limited. Platinum group metal-containing alloy. 4,061,495, Cl. 75-134.00F.

Semenenko, Jury Lukich. Rolls of a skewed-roll machine for trueing cylindrical metal articles. 4,061,008, Cl. 72-98.000.

Sendor, Bernard T.; and Sendor, Mortimer S. Paper welding apparatus for bookbinding machinery. 4,061,523, Cl. 156-380.000.

Sendor, Mortimer S.: *See—*
Sendor, Bernard T.; and Sendor, Mortimer S., 4,061,523, Cl. 156-380.000.

Senjo, Teizo; and Kobayashi, Makio, to Fuji Kasui Engineering Co., Ltd.; and Sumitomo Metal Industries, Ltd. Exhaust gas scrubbing process. 4,061,743, Cl. 423-235.000.

Sereda, Viktor Grigorievich: *See—*
Kaporovich, Vladimir Georgievich; Sereda, Viktor Grigorievich; Udovenko, Vitaly Kirillovich; Zelenskaya, Nadezhda Nikolaevna; Brazhnik, Viktor Yakovlevich; Sviridov, Evgeny Pavlovich; and Fabrichev, Jury Nikolaevich, 4,061,009, Cl. 72-69.000.

Servomed Arzei GmbH & Co. Pharma KG, Firma: *See—*
Wawretschek, Wolfgang; and Wawretschek, Lothar, 4,061,741, Cl. 424-232.000.

Seto, Kenneth Hon: *See—*
Thompson, James Thomas; and Seto, Kenneth Hon, 4,061,805, Cl. 428-31.000.

Shaburov, Fedor Fedorovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.

Shakespeare Company: *See—*
Lindler, James Monroe; and Romanyszyn, Michael Taras, Jr., 4,061,806, Cl. 428-35.000.

Shakespeare, Keith James. Paper-winding units. 4,061,287, Cl. 242-67.10R.

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Shaymar, Inc.: *See—*
Phillips, William W., 4,061,877, Cl. 179-1.00E.

Shearer, Robert: *See—*
Lerner, Stanley; and Shearer, Robert, 4,061,521, Cl. 156-265.000.

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Meijs, Franciscus H.; and Davies, David R., 4,061,191, Cl. 166-292.000.
Nielsen, Robert P.; and Kilty, Peter A., 4,061,659, Cl. 260-348.340.
Powell, James E., 4,061,749, Cl. 424-246.000.
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Shenoy, Umakant Devdas, to DDSA Pharmaceuticals Ltd. Azeto [2,3-b][1,4] benzo diazepines. 4,061,745, Cl. 424-244.000.

Shepard, Kenneth L.; and Paleveda, William J., Jr., to Merck & Co., Inc. Tricyclicdicarboximides. 4,061,763, Cl. 424-274.000.

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Keller, Dale L., 4,061,059, Cl. 82-1.00C.

Sherman, Michael I.: *See—*
Laakso, Oliver A.; and Sherman, Michael I., 4,061,193, Cl. 162-19.000.

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Glowaky, Raymond Charles; Rudolph, Stephen Edward; and Bierwagen, Gordon Paul, 4,061,610, Cl. 260-17.4ST.
Glowaky, Raymond Charles; Rudolph, Stephen Edward; and Bierwagen, Gordon Paul, 4,061,611, Cl. 260-17.4ST.

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Matsushita, Takeshi; Hayashi, Hisao; and Shibasaki, Mitsuru, 4,062,034, Cl. 357-16.000.

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Shimago, Kozo: *See—*
Yamada, Hirotada; Okamura, Kosaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,061,748, Cl. 424-246.000.

Shimanuki, Fujio: *See—*
Kotezawa, Katsutaka; Onodera, Toshimi; Hayashi, Setsuo; and Shimanuki, Fujio, 4,062,016, Cl. 343-178.000.

Shimizu, Kazuyuki: *See—*
Yoshida, Toru; Hosoi, Kameo; Yoshida, Tokuzo; Shimizu, Kazuyuki; and Nakagawa, Koithiro, 4,060,913, Cl. 34-80.000.

Shimizu, Masami: *See—*
Tsunekawa, Tokuichi; Uchidoi, Masanori; Shimizu, Masami; Yamamichi, Masayoshi; Murayama, Keiya; and Aizawa, Hiroshi, 4,062,024, Cl. 354-60.00R.
Shimizu, Soichiro, to Tokyo Fabric Kogyo Kabushiki Kaisha. Water seal packing for sealing water at the coupling portion of underwater structures. 4,060,993, Cl. 61-43.000.
Shimojo, Nobuei: *See—*
Saito, Shunjiro; Aue, Kazuhide; and Shimojo, Nobuei, 4,061,558, Cl. 204-290.00F.
Shinoda, Nobuhiko: *See—*
Murakami, Hiroyashu; Ito, Tadashi; Ito, Fumio; Sakurada, Nobuaki; Kawamura, Mashaharu; and Shinoda, Nobuhiko, 4,062,022, Cl. 354-38.000.
Shinoda, Yoshio: *See—*
Kuno, Akira; and Shinoda, Yoshio, 4,061,023, Cl. 73-114.000.
Shionogi & Co., Ltd.: *See—*
Narisada, Masayuki, 4,061,854, Cl. 544-88.000.
Sato, Fumio; Sakamoto, Teruo; Watashiro, Seiichi; Inoue, Hayao; and Yahata, Yoshihito, 4,061,164, Cl. 141-90.000.
Yukinaga, Hisajiro; Kano, Hideo; and Ogata, Masaru, 4,061,490, Cl. 71-68.000.
Shipley Company Inc.: *See—*
Gulla, Michael, 4,061,588, Cl. 252-429.00R.
Shiraishi, Takeichi: *See—*
Kuroda, Nobuyuki; Shiraishi, Takeichi; Itoh, Akio; Matsuura, Kazuo; and Miyoshi, Mituji, 4,061,857, Cl. 526-114.000.
Short, Barrett John: *See—*
Nolan, John Howard; Goddard, Donald Lawrence; and Short, Barrett John, 4,061,535, Cl. 176-38.000.
Shuler, Bernard R., to American Air Filter Company, Inc. Ventilating air filtering and distributing device. 4,061,082, Cl. 98-40.00D.
Shultz, Gilbert F.; and Bailey, Ronald W., to Application Engineering Corporation. Water chiller control. 4,060,997, Cl. 62-180.000.
Shuruev, Lev Andreevich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.
Sickles, Ralph A. Rectilinear transport means. 4,061,232, Cl. 214-1.0BB.
Siebert, Larry D., to KMS Fusion, Inc. Laser fusion pulse shape controller. 4,061,985, Cl. 331-94.50C.
Siegal, Sanford: *See—*
Beer, Irwin B.; and Siegal, Sanford, 4,061,256, Cl. 224-5.00D.
Siegrist, Adolf Emil: *See—*
Kormany, Geza; Kabas, Guglielmo; Schlapfer, Hans; and Siegrist, Adolf Emil, 4,061,860, Cl. 542-462.000.
Siemens Aktiengesellschaft: *See—*
Aulich, Hubert; and Grabmaier, Josef, 4,061,484, Cl. 65-2.000.
Berglund, Kurt, 4,062,020, Cl. 346-33.00R.
Fettweis, Alfred, 4,061,905, Cl. 364-724.000.
Friebel, Eberhard, 4,061,032, Cl. 73-273.000.
Jager, Philipp, 4,061,838, Cl. 429-22.000.
Keller, Roman, 4,061,413, Cl. 339-95.00R.
Kessler, Heinrich Hubert, 4,061,928, Cl. 307-200.00B.
Kvaerna, Sverre; and Barud, Sigvard, 4,061,324, Cl. 269-325.000.
Niethammer, Dieter; and Paetsch, Werner, 4,061,997, Cl. 340-146.1AX.
Poensgen, Rudolf, 4,061,418, Cl. 350-160.0LC.
Politycki, Alfred, 4,061,814, Cl. 428-196.000.
Winstel, Guenter, 4,062,035, Cl. 357-17.000.
Wintzer, Klaus, 4,061,879, Cl. 179-15.0BA.
Zeidler, Guenter; and Auracher, Franz, 4,062,043, Cl. 358-86.000.
Zirwas, Johann Gerhard, 4,061,984, Cl. 330-149.000.
Siemer, Klaus: *See—*
Becker, Wolf-Jurgen; Breuer, Wolfram; and Siemer, Klaus, 4,061,467, Cl. 23-232.00R.
Sillion, Bernard: *See—*
Leleu, Gerard; Bedague, Pierre; and Sillion, Bernard, 4,061,581, Cl. 252-32.70E.
Simokat, Frank L., to TII Corporation. Multi-function fail-safe arrangements for overvoltage gas tubes. 4,062,054, Cl. 361-119.000.
Simon, Eli. Reaction products of benzenephosphonic acid and melamine as flame-retardant additives. 4,061,605, Cl. 260-2.5AJ.
Singleton, Thomas C., to Monsanto Company. Purification of acetic acid. 4,061,546, Cl. 203-31.000.
Sistig, Eberhard; and Reinermann, Karl-Heinz, to Chemische Werke Huls Aktiengesellschaft. Process for cooling a polymerization reactor. 4,061,848, Cl. 526-61.000.
Sitzmann, Michael E.: *See—*
Dacons, Joseph C.; and Sitzmann, Michael E., 4,061,658, Cl. 260-346.110.
Siukola, Matti Solmu Olavi: *See—*
Woodward, Oakley McDonald; and Siukola, Matti Solmu Olavi, 4,062,019, Cl. 343-797.000.
Sivilotti, Olivo Giuseppe, to Alcan Research and Development Limited. Apparatus and procedure for the belt casting of metal. 4,061,177, Cl. 164-87.000.
Sivilotti, Olivo Giuseppe; Steer, David Edward; and Stock, Thomas Adrian Cheetham, to Alcan Research and Development Limited. Continuous casting of metal strip between moving belts. 4,061,178, Cl. 164-87.000.
Sivilotti, Olivo Guiseppe: *See—*
Stock, Thomas Adrian Cheetham; Dougan, Patrick Daniel; and Sivilotti, Olivo Guiseppe, 4,061,010, Cl. 72-201.000.
Sivyer Steel Corporation: *See—*
Whitney, Richard P., 4,061,277, Cl. 241-73.000.
Sjoholm, Ingvar Gosta Holger; Lindmark, Nils Roger; and Ekman, Bo Magnus. Biologically active composition and the use thereof. 4,061,466, Cl. 23-230.00B.
Skachkova, Nina Andreevna: *See—*
Bart, Evgeny Vasilievich; Batalin, Oleg Efimovich; Troitsky, Andrian Petrovich; Skachkova, Nina Andreevna; Lebedev, Vladimir Mikhailovich; and Trifonova, Rimma Petrovna, 4,061,680, Cl. 260-606.000.
Skaggs, Leonard L. Water tender. 4,060,934, Cl. 47-79.000.
Skallerup, Robert M. Sighting device for relocation of site. 4,060,908, Cl. 33-275.00R.
Skidmore, Sam C., Jr. Method and apparatus for drilling in permafrost and the like. 4,061,197, Cl. 175-101.000.
Skinner, Charles A., to Electro-Therm, Inc. Terminal for a resistance heating element. 4,061,412, Cl. 339-263.00R.
Skyhook Sales Corporation: *See—*
Jacobsen, Arnold Ralph; and Jaffe, I. Pompe, 4,061,092, Cl. 108-149.000.
Slezak, Raymond J. Tire bead covering apparatus. 4,061,525, Cl. 156-460.000.
Sloan, Kenneth B.: *See—*
Bodor, Nicolae S.; and Sloan, Kenneth B., 4,061,753, Cl. 424-253.000.
Sloane, Edwin A.; and McKeever, Bruce T., to Time/Data Corporation. Structural analysis system. 4,061,017, Cl. 73-579.000.
Slusarchyk, William A.: *See—*
Dolfini, Joseph E.; Bohme, Ekkehard; and Slusarchyk, William A., 4,061,629, Cl. 260-239.100.
Sly, Gerald: *See—*
Magid, Robert P.; and Sly, Gerald, 4,061,820, Cl. 428-311.000.
Smal, Henri, to Societe Anonyme FACO. Twist prevention device. 4,061,381, Cl. 339-8.00P.
Smaw, Jesse B.: *See—*
Marcalus, Nicholas; and Smaw, Jesse B., 4,061,325, Cl. 270-40.000.
Smith, Charles A. Automatic chinchilla sander and cleaner. 4,061,111, Cl. 119-159.000.
Smith, Dale Maxwell. Aerosol dispenser ring. 4,061,249, Cl. 222-78.000.
Smith, Frank P. Automatic weapon. 4,061,075, Cl. 89-132.000.
Smith International Inc.: *See—*
Villaloboz, Arthur A., 4,061,376, Cl. 308-8.200.
Smith, Marvin W.: *See—*
Perkins, Donald W.; and Smith, Marvin W., 4,062,057, Cl. 363-71.000.
Smith, Robert, to General Motors Corporation. Cooling coil and air distribution system defrost means. 4,061,482, Cl. 62-155.000.
Smith, Samuel: *See—*
Schultz, William J.; and Smith, Samuel, 4,061,624, Cl. 260-79.30M.
Smith, Wilbur J. Clicker for indicating position of arrow. 4,061,107, Cl. 116-67.00R.
Smithgall, Harry E.: *See—*
DiDominico, Mario A.; and Smithgall, Harry E., 4,061,943, Cl. 313-482.000.
SmithKline Corporation: *See—*
Levine, Marshall S.; and Faulkner, Albert A., 4,061,108, Cl. 118-100.000.
Smulders, Adrianus Josephus: *See—*
de Jonge, Jan Hendrik; and Smulders, Adrianus Josephus, 4,061,908, Cl. 235-302.300.
Snam Progetti S.p.A.: *See—*
Gagliardi, Renzo, 4,061,675, Cl. 260-555.00A.
Snider, Grover E.: *See—*
Rackard, Troy D.; and Snider, Grover E., 4,060,950, Cl. 52-456.000.
Snow, John P., to Samuel Moore and Company. Electrical connector assembly. 4,061,407, Cl. 339-75.00P.
Snyder, Robert P.: *See—*
Harwood, William James; and Snyder, Robert P., 4,061,165, Cl. 144-1.00R.
Sobel, A. Theodore: *See—*
Zall, Robert R.; Sobel, A. Theodore; and Price, Donald R., 4,061,504, Cl. 134-95.000.
Societa Italo-Britannica L. Manetti - H. Roberts & C.: *See—*
Orzalesi, Giovanni; and Selleri, Renato, 4,061,668, Cl. 260-500.50H.
S.A. des Anciens Etablissements Paul Wurth: *See—*
Legille, Edouard, 4,061,036, Cl. 73-421.50A.
Societe Anonyme dite: L'Oreal: *See—*
Kalopissis, Gregoire; Bouillon, Claude; and Vayssie, Charles, 4,061,730, Cl. 424-59.000.
Societe Anonyme FACO: *See—*
Smal, Henri, 4,061,381, Cl. 339-8.00P.
Societe General de Constructions Electriques et Macaniques Alsthom: *See—*
Coulon, Andre; and Perrin, Rene, 4,060,883, Cl. 29-156.80R.
Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie": *See—*
Chillier-Duchatel, Nicole; and Verger, Bernard, 4,061,554, Cl. 204-129.000.
Societe Goro: *See—*
Schick, Jean-Francois, 4,060,877, Cl. 24-33.00B.

Societe Nationale Elf Aquitaine: *See—*
Bernard, Jean-Rene; Bousquet, Jacques; and Grand, Michel, 4,061,690, Cl. 260-676.00R.

Solheim, Fredrick S.; and Erb, Lee A. Combustion monitoring system. 4,062,006, Cl. 340-228.00R.

Solin, Stuart A.: *See*
Widran, Jerrold; and Solin, Stuart A., 4,061,135, Cl. 128-6.000.

Solli, Houk: *See—*
Madsen, Hans Berg; Holst, Preben Lindholm; and Solli, Houk, 4,061,757, Cl. 424-263.000.

Solomons, Gerald L.; and Scammell, Gerald W., to Ranks Hovis McDougall Limited. Edible protein substances composed of fungal mycellium. 4,061,781, Cl. 426-60.000.

Solvay & Cie.: *See—*
Verlaeten, Jean; and Demilie, Paul, 4,061,718, Cl. 423-356.000.

Somm, Paul T., to Boeing Company, The. Shock absorbing method and apparatus. 4,061,295, Cl. 244-104.0FP.

Sommerkamp, Peter; and Heil, Walter, to Leybold-Heraeus GmbH & Co. KG. Electron gun for heating, melting and vaporizing purposes, with deflection systems. 4,061,871, Cl. 13-31.000.

Somoano, Robert B.: *See—*
Hadek, Vaclav; Somoano, Robert B.; and Rembaum, Alan, 4,061,834, Cl. 428-522.000.

Sony Corporation: *See—*
Kitamura, Tomosaburo, 4,061,816, Cl. 428-218.000.
Kuroda, Nobukazu, 4,061,509, Cl. 148-31.550.
Matsushita, Takeshi; Hayashi, Hisao; and Shibasaki, Mitsuru, 4,062,034, Cl. 357-16.000.
Sato, Tsutomu, 4,061,980, Cl. 325-419.000.
Suzuki, Kunizo, 4,062,033, Cl. 357-15.000.
Suzuki, Tadao, 4,061,983, Cl. 330-207.00P.

Sopha, Klaus, to Robert Bosch G.m.b.H. Electrohydraulic control system. 4,061,155, Cl. 137-85.000.

Souza, Lawrence C.: *See—*
Frye, Burton L.; Pittman, Max G.; Runge, David A.; Souza, Lawrence C.; and LaVoie, Raymond V., 4,061,480, Cl. 55-356.000.

Spence-Bate, Harry Arthur Hele. Method and apparatus for microform updating. 4,062,025, Cl. 354-76.000.

Spencer, Edward: *See—*
Spencer, Frederick J.; and Spencer, Edward, 4,061,203, Cl. 182-214.000.

Spencer, Frederick J.; and Spencer, Edward, to Spencer Tool & Mfg. Co. Inc. Ladder attachment. 4,061,203, Cl. 182-214.000.

Spencer Tool & Mfg. Co. Inc.: *See—*
Spencer, Frederick J.; and Spencer, Edward, 4,061,203, Cl. 182-214.000.

Spencer Wright Industries, Inc.: *See—*
Price, Herbert Benjamin, 4,061,095, Cl. 112-79.00R.

Sponseller, David R.: *See—*
Fabris, Hubert J.; Gruber, David P.; Sponseller, David R.; and Uelzmann, Heinz, 4,061,845, Cl. 526-11.100.

Sprague, Peter W., to E. R. Squibb & Sons, Inc. 3,6-Dicarboximidamidecarbazoles. 4,061,655, Cl. 260-315.000.

Spurles, Louise Leone: *See—*
Price, Edgar Elmer; and Spurles, Louise Leone, 4,061,419, Cl. 350-184.000.

Stahl, Roy Layton. Auxiliary wheel assembly. 4,061,349, Cl. 280-47.200.

Stahlecker, Fritz; and Stahlecker, Hans. Guide track arrangement and method of adjusting the same. 4,060,963, Cl. 57-1.00R.

Stahlecker, Hans: *See—*
Stahlecker, Fritz; and Stahlecker, Hans, 4,060,963, Cl. 57-1.00R.

Standard Oil Company (Indiana): *See—*
Poppe, Wassily; and Fielding, Ivor R., 4,061,835, Cl. 428-522.000.

Stanley, Alexander J.: *See—*
Pinto, Albert A.; and Stanley, Alexander J., 4,061,081, Cl. 93-53.0SD.

Stanley, Henry; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Process for preparing stable polyurethane latices. 4,061,618, Cl. 260-29.2TN.

Star Seimitsu Kabushiki Kaisha: *See—*
Shigemori, Youjiro; Mitumori, Yoshio; and Yonezawa, Toshiaki, 4,062,050, Cl. 360-30.000.

Starp, Franz, to Carl Zeiss Stiftung. Interchangeable lens retaining means for photographic cameras. 4,062,030, Cl. 354-286.000.

Start S.p.A. Studi Apparecchiature e Richerche Tecniche: *See—*
Fasano, Osvaldo, 4,061,210, Cl. 188-79.50P.

Stastny, Fritz; Gaeth, Rudolf; Haardt, Udo; and Koerner, Heinz-Hermann, to BASF Aktiengesellschaft. Manufacture of soft and resilient foams. 4,061,701, Cl. 264-51.000.

Statt, Wayne H.: *See—*
Miller, Carl W.; Vandenberg, Lester C.; and Statt, Wayne H., 4,061,709, Cl. 264-293.000.

Ste Anonyme Dite Brasseries Kron Enbourg: *See—*
Noel, Jean Pierre; and Bauer, Gilbert, 4,061,016, Cl. 73-60.100.

Steck, Werner: *See—*
Ohlinger, Manfred; Schoenafinger, Eduard; Vaeth, Guenter; Stritzinger, Heinz; Koester, Eberhard; Schneehage, Hans Henning; and Steck, Werner, 4,061,726, Cl. 423-634.000.

Steckel, Thomas Frier, to Lubrizol Corporation, The. Phenoxide-halo carboxylic acid condensate additives for fuels. 4,061,474, Cl. 44-66.000.

Steer, David Edward: *See—*
Sivilotti, Olivo Giuseppe; Steer, David Edward; and Stock, Thomas Adrian Cheetham, 4,061,178, Cl. 164-87.000.

Steetley (Mfg.) Limited: *See—*
Randle, Raymond Thomas, 4,061,575, Cl. 210-350.000.

Steidle, Wallace C. Apparatus and method for the farming of clams. 4,061,110, Cl. 119-4.000.

Stein, Robert George: *See—*
Crovetti, Aldo Joseph; and Stein, Robert George, 4,061,764, Cl. 424-275.000.

Stern, Donald J.; and Allsop, Jon I., to Allsop Automatic Inc. Shock-absorbing ski pole grip. 4,061,347, Cl. 280-11.37H.

Stetson, Karl A.; and Agren, Carl Hugo. Stringed instrument with an improved back plate construction. 4,061,068, Cl. 84-275.000.

Stevens, Everett Earle: *See—*
Litva, John; and Stevens, Everett Earle, 4,062,015, Cl. 343-120.000.

Stevenson, George J.: *See—*
Austin, Stephen R.; and Stevenson, George J., 4,061,237, Cl. 214-515.000.

Stewart, Joseph H., Jr.: *See—*
Dutton, Frederick O., III; and Stewart, Joseph H., Jr., 4,061,517, Cl. 156-212.000.

Stewart, Roger Green, to RCA Corporation. Current mirror amplifier augumentation of regulator transistor current flow. 4,061,962, Cl. 323-22.00R.

Stewart, William James, to Plessey Handel und Investments A.G. Optical fibre connector. 4,061,416, Cl. 350-96.00C.

Stiles, John Callender. Electrostatic rate gyroscope. 4,061,043, Cl. 74-5.60D.

Stock, Thomas Adrian Cheetham; Dougan, Patrick Daniel; and Sivilotti, Olivo Guiseppe, to Alcan Research and Development Limited. Apparatus for cooling the rolls of rolling mills. 4,061,010, Cl. 72-201.000.

Stock, Thomas Adrian Cheetham: *See—*
Sivilotti, Olivo Giuseppe; Steer, David Edward; and Stock, Thomas Adrian Cheetham, 4,061,178, Cl. 164-87.000.

Stocker, Phillip J.: *See—*
United States of America, National Aeronautics and Space Administration; Stocker, Phillip J.; and Marcus, Harris L., 4,061,427, Cl. 356-159.000.

Storey, Curtis B. Hand-warming and liquid-heating device. 4,061,128, Cl. 126-210.000.

Strange, Delbert D.; and Hunts, Ronald M., to Manufacturing Approaches & Total Concepts, Inc. Pilot hole borer. 4,061,437, Cl. 408-42.000.

Strickman, Melvyn B.: *See—*
Strickman, Robert L.; and Strickman, Melvyn B., 4,061,144, Cl. 128-227.000.

Strickman, Robert L.; and Strickman, Melvyn B. Disposable syringe. 4,061,144, Cl. 128-227.000.

Stritzinger, Heinz: *See—*
Ohlinger, Manfred; Schoenafinger, Eduard; Schneider, Walter; Stritzinger, Heinz; and Vaeth, Guenter, 4,061,725, Cl. 423-634.000.
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Strok, Jack M., Jr., to General Electric Company. Low noise sodium vapor lamp for sonic pulse operation. 4,061,939, Cl. 313-25.000.

Strong, W. Albert, to PPG Industries, Inc. Hydrogen peroxide stabilization with phenylphosphonic acids. 4,061,721, Cl. 423-272.000.

Strugatz, Arthur. Process for mass-producing works of art made from wooden strips. 4,061,514, Cl. 156-63.000.

Strycker, Wallace Glenn: *See—*
Havera, Herbert John; and Strycker, Wallace Glenn, 4,061,760, Cl. 424-267.000.

Stubbs, Rex G., Jr.: *See—*
Clark, Anthony W.; and Stubbs, Rex G., Jr., 4,061,442, Cl. 417-36.000.

Stucki, Alfred B.: *See—*
Saunders, Jim G.; and Stucki, Alfred B., 4,061,901, Cl. 235-92.0EV.

Stupak, Leonid Mikhailovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Izrailevich; Baglai, Vitaly Mikhailovich; Latash, Jury Vadimovich; Emelyanenko, July Georgievich; Stupak, Leonid Mikhailovich; Alferov, Jury Fedorovich; Bondarenko, Oleg Petrovich; Schupak, Grigory Bentsionovich; Shuruev, Lev Andreevich; Khasin, Kim Moiseevich; Frolov, Jury Fedorovich; Salmin, Valery Vasilievich; Lugovsky, Vladimir Ivanovich; Marjuschenko, Vilen Fedorovich; Shaburov, Fedor Fedorovich; Schelkunov, Jury Andreevich, deceased; and Schelkunova, Margarita Petrovna, administratrix, 4,061,180, Cl. 164-252.000.

Suarez, Diego Rolando, to Inter-American Transport Equipment Company. Vehicle with side dumping mechanism over the top rail. 4,061,235, Cl. 214-64.000.

Sue, Takaji: *See—*
Fujimoto, Sakae; Sue, Takaji; and Misawa, Toshihiko, 4,061,328, Cl. 271-10.000.

Sugai, Tetuya, to Nippon Steel Corporation. Receiver for pulses of different widths. 4,061,975, Cl. 325-322.000.

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Sugimoto, Isao; and Sawase, Yoko, to Kanebo, Ltd. Stable preparation of water-soluble salts of dehydroepiandrosterone sulfate for parenteral administration. 4,061,744, Cl. 424-243.000.

Sugiyama, Masayoshi: *See—*
Nohtomi, Ryota; Sugiyama, Masayoshi; and Shigeyoshi, Tuyoshi, 4,061,707, Cl. 264-95.000.

Sukornick, Bernard: *See—*
Minhas, Pritam Singh; and Sukornick, Bernard, 4,061,810, Cl. 428-85.000.

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Bradley, Robert L.; and Sullivan, Daniel J., 4,061,344, Cl. 277-26.000.

Sullivan, Richard N.; and Vance, John E., to Garrett Corporation, The. Gearbox decoupler. 4,061,216, Cl. 192-46.000.

Sumitomo Chemical Company, Limited: *See—*
Itoh, Iko; Inoue, Yasuhiko; and Nagaoka, Kenji, 4,061,844, Cl. 526-4.000.
Yamada, Hirotada; Okamura, Kosaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,061,748, Cl. 424-246.000.

Sumitomo Electric Industries, Ltd.: *See—*
Nishiyama, Yukinori, 4,061,208, Cl. 188-71.900.

Sumitomo Metal Industries, Ltd.: *See—*
Senjo, Teizo; and Kobayashi, Makio, 4,061,743, Cl. 423-235.000.

Summers, Jack C., to General Motors Corporation. Stabilization of calcium oxide sulfate trapping materials. 4,061,593, Cl. 252-443.000.

Sumrell, Gene: *See—*
Mod, Robert R.; Magne, Frank C.; Sumrell, Gene; and Novak, Arthur F., 4,061,634, Cl. 544-158.000.

Sundstrom, Nils Eskil, to AB Westin & Backlund. Position regulator. 4,061,080, Cl. 92-13.200.

Sunjara, Sime: *See—*
Murray, John S.; and Sunjara, Sime, 4,061,898, Cl. 219-211.000.

Suzuki, Kunizo, to Sony Corporation. Schottky barrier type semiconductor device. 4,062,033, Cl. 357-15.000.

Suzuki, Nobukazu: *See—*
Yokokawa, Takao; Kanazawa, Shogo; Otoguro, Yasuo; Suzuki, Nobukazu; Akase, Sigeyuki; Miida, Noboru; Akazawa, Tadahisa; and Kuroiwa, Kazuya, 4,061,494, Cl. 75-124.000.

Suzuki, Seigo; and Moriya, Yoshiaki, to Tokyo Shibaura Electric Co., Ltd. Information processing system. 4,062,059, Cl. 364-200.000.

Suzuki, Tadao, to Sony Corporation. Transistor amplifier with protective circuit. 4,061,983, Cl. 330-207.00P.

Svensson, Hugo Ragnvald: *See—*
Karlsson, Jarding Urban; and Svensson, Hugo Ragnvald, 4,061,288, Cl. 242-84.10K.

Sviridov, Evgeny Pavlovich: *See—*
Kaporovich, Vladimir Georgievich; Sereda, Viktor Grigorievich; Udovenko, Vitaly Kirillovich; Zelenskaya, Nadezhda Nikolaevna; Brazhnik, Viktor Yakovlevich; Sviridov, Evgeny Pavlovich; and Fabrichev, Jury Nikolaevich, 4,061,009, Cl. 72-69.000.

Swain, Allan L.: *See—*
Tallent, Michael W.; Scaggs, Lee E.; Swain, Allan L.; Harrison, Ronnie M.; and Hendershot, William B., III, 4,062,041, Cl. 358-8.000.

Swain, Samuel J. Combinational fireplace unit. 4,061,133, Cl. 126-350.00R.

Swaniger, James R.; and Schubert, Keith E., to Pitney-Bowes, Inc. Meter setting indexing gear apparatus. 4,061,044, Cl. 74-31.000.

Swanson, James P.: *See—*
Kindgren, Lee; and Swanson, James P., 4,061,064, Cl. 83-368.000.

Swanson, William C.: *See—*
Orth, Harold R.; and Swanson, William C., 4,061,079, Cl. 91-372.000.

Swartzentruber, Glenn A.: *See—*
Roantree, James P.; and Swartzentruber, Glenn A., 4,062,004, Cl. 340-187.000.

Swiss Aluminium Limited: *See—*
Miller, Larry J.; Miller, Marion V.; and Liebetrau, Richard E., 4,060,935, Cl. 49-25.000.

Sydnor, Richard L.: *See—*
United States of America, National Aeronautics and Space Administration; Sydnor, Richard L.; and MacConnell, John W., 4,061,974, Cl. 325-58.000.

Symons, Cedric Brian; and Symons, Kenneth Brian. Trailer suspension. 4,061,363, Cl. 280-718.000.

Symons, Kenneth Brian: *See—*
Symons, Cedric Brian; and Symons, Kenneth Brian, 4,061,363, Cl. 280-718.000.

Systems Using Nature Ltd.: *See—*
Finigan, George D.; May, Brian E.; and Zaininger, Henry W., 4,060,916, Cl. 35-10.000.

Sze, Morgan C., to Lummus Company, The. Molten salt lift gas system for production of chlorinated hydrocarbons. 4,061,471, Cl. 23-260.000.

Szkrybalo, William, to Hoffmann-La Roche Inc. Abscission compositions. 4,061,489, Cl. 71-88.000.

Tada, Tetsuya. Depress button type sprayer. 4,061,250, Cl. 222-321.000.

Taenzer, Jon C., to Sanford Research Institute. Nutating radiation deflecting method and apparatus. 4,061,415, Cl. 350-6.000.

Tai, Wun Ten; Mura, Lawrence A.; Phillips, Kenneth G.; and Ballweber, Edward G., to Nalco Chemical Company. Phosphate esters. 4,061,695, Cl. 260-929.000.

Taiyo Kaken Company, Ltd.: *See—*
Murakami, Heiichiro; and Okamoto, Tsuneo, 4,061,477, Cl. 55-79.000.

Tajbl, Franz: *See—*
Gillitzer, Max; and Tajbl, Franz, 4,061,899, Cl. 219-131.00R.

Takada, Juichiro, to Takata Kojyo Co., Ltd. Seat belt buckle. 4,060,879, Cl. 24-230.00A.

Takahashi, Sasuke. Apparatus for stopping and releasing the movement of a sliding up-and-down pole of a portable motion picture screen stand. 4,061,300, Cl. 248-125.000.

Takahashi, Tomio: *See—*
Nomura, Hirokazu; Tohno, Katsumi; and Takahashi, Tomio, 4,061,262, Cl. 228-50.000.

Takasago Thermal Engineering Co., Ltd: *See—*
Yoshida, Toru; Hosoi, Kameo; Yoshida, Tokuzo; Shimizu, Kazuyuki; and Nakagawa, Koithiro, 4,060,913, Cl. 34-80.000.

Takase, Hideo; Ishii, Toyota; and Nishiumi, Shiro, to Toray Industries Inc. Antistatic carpet and production thereof. 4,061,811, Cl. 428-95.000.

Takata Kojyo Co., Ltd: *See—*
Takada, Juichiro, 4,060,879, Cl. 24-230.00A.

Takei, Akira: *See—*
Togei, Ryoiku; Takei, Akira; and Wada, Kunihiko, 4,062,037, Cl. 357-24.000.

Takeshita, Tomon, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation apparatus for an internal combustion engine. 4,061,119, Cl. 123-119.00A.

Talbot, James Richard, to Fiber Industries Inc. Simulated spun-like bulked yarn. 4,060,970, Cl. 57-140.00R.

Tallent, Michael W.; Scaggs, Lee E.; Swain, Allan L.; Harrison, Ronnie M.; and Hendershot, William B., III, to Consolidated Video Systems, Inc. Input voltage controlled oscillator circuit for a television signal time base corrector. 4,062,041, Cl. 358-8.000.

Tamabayashi, Hanzo: *See—*
Katsuragawa, Kanzi; Hattori, Tatsuo; Kihara, Keiichi; and Tamabayashi, Hanzo, 4,061,669, Cl. 260-505.00N.

Tanabe Seiyaku Co., Ltd.: *See—*
Miyoshi, Munetsugu; Matsumoto, Kazuo; Urabe, Yuji; and Iwasaki, Tameo, 4,061,650, Cl. 260-307.00F.

Tanaka, Sadaharu; Saito, Sadayuki; and Hirano, Sensaburo, to United States Steel Corporation. Mobile truck for relining a converter. 4,061,319, Cl. 266-281.000.

Tanbara, Masakazu: *See—*
Hoshino, Kazuo; and Tanbara, Masakazu, 4,061,211, Cl. 188-79.50P.

Tannahill, Alex L.: *See—*
Finn, Robert K.; Tannahill, Alex L.; and Laptewicz, Joseph E., Jr., 4,061,585, Cl. 252-89.00R.

Tanno, Norihiko: *See—*
Yamada, Hirotada; Okamura, Kosaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,061,748, Cl. 424-246.000.

Tanouchi, Tadao: *See—*
Hayashi, Masaki; Tanouchi, Tadao; Ito, Hiroyuki; and Ohyama, Isao, 4,061,865, Cl. 560-121.000.

Taradaiko, Alexandr Korneevich: *See—*
Lifshits, Viktor Senderovich; Petrov, Georgy Nikolaevich; Papkov, Oleg Sergeevich; Khomenko, Vladimir Ivanovich; Gerasimenko, Alexandr Yakovlevich; Taradaiko, Alexandr Korneevich; Zemchenko, Alexandr Mikhailovich; and Gremyakov, Ivan Petrovich, 4,061,078, Cl. 90-24.00C.

Tasseron, Frans A. W., to Koninklijke Emballage Industrie Van Leer B.V. Closure for a container. 4,061,239, Cl. 215-221.000.

Taylor, David W.: *See—*
Peterson, Philip R.; Taylor, David W.; and Levijoki, Wayne A., 4,061,402, Cl. 303-92.000.
Peterson, Philip R.; and Taylor, David W., 4,061,403, Cl. 303-106.000.

Taylor, Dennis O.: *See—*
Rajasekaran, Ramanujam; Taylor, Dennis O.; and Whittlesey, James W., 4,061,187, Cl. 165-107.000.

Taylor, Gary Newton, to Bell Telephone Laboratories, Incorporated. Negative resist for X-ray and electron beam lithography and method of using same. 4,061,829, Cl. 428-451.000.

Taylor, Leonard Harold, to Perkin-Elmer Limited. Ink recorder with grooved pressure roller feed. 4,062,021, Cl. 346-136.000.

Taylor, Robert T. Decoration platform assembly. 4,061,306, Cl. 248-523.000.

Taylor, William T.: *See—*
Keller, V. J.; and Taylor, William T., 4,061,389, Cl. 294-86.300.

TDK Electronics Co., Ltd.: *See—*
Saito, Shunjiro; Aue, Kazuhide; and Shimojo, Nobuei, 4,061,558, Cl. 204-290.00F.

Tecumseh Products Company: *See—*
MacLeod, John Norman, 4,061,121, Cl. 123-149.00R.

Tecumseh Products Company (Compressor): *See—*
Kandpal, Tara, 4,061,935, Cl. 310-68.00C.

Tefft, Edward G.: *See—*
Kennedy, Richard W.; and Tefft, Edward G., 4,061,510, Cl. 148-187.000.

Telefonaktiebolaget L M Ericsson: *See—*
Widl, Walter Herbert Erwin, 4,061,881, Cl. 179-15.0BF.

Ternehall, Runo Roy Oskar, to AB Volvo. Hydrodynamic brake device for motor vehicles. 4,061,214, Cl. 188-277.000.

Teshima, Masahiko: *See—*
Kawaoka, Yutaka; Kifune, Tatsuo; Teshima, Masahiko; and Koizumi, Tatsuya, 4,061,646, Cl. 260-306.000.

Teufel, Hermann; Bartmann, Wilhelm; Granzer, Ernold; and Musil, Josef, to Hoechst Aktiengesellschaft. Derivatives of the 1,2-diarylethylene and pharmaceutical compositions thereof. 4,061,772, Cl. 424-304.000.

Teufel, Hermann: *See—*
Beck, Gerhard; Kunstmann, Rudolf; Babej, Milos; and Teufel, Hermann, 4,061,671, Cl. 260-514.00D.
Tex-Tube Division of Detroit Steel Corporation: *See—*
Lloyd, Donald, 4,061,960, Cl. 323-9.000.
Texaco Inc.: *See—*
Arnold, George B., 4,060,988, Cl. 60-641.000.
Jones, Henry B.; and Bunn, Dorrance P., Jr., 4,061,162, Cl. 138-147.000.
Love, Richard F.; and Duranleau, Roger G., 4,061,651, Cl. 260-307.00H.
Texas Instruments Incorporated: *See—*
Brewer, Terry L., 4,061,799, Cl. 427-43.000.
McElroy, David Joal, 4,061,506, Cl. 148-1.500.
Textron Inc.: *See—*
Moertel, George B., 4,060,886, Cl. 29-410.000.
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Single reflex camera. 4,062,028, Cl. 354-152.000.
Thermoplastice Processes Inc.: *See—*
Hessenthaler, Herbert C., 4,061,461, Cl. 425-462.000.
Thiokol Corporation: *See—*
Bertozzi, Eugene R.; Hoffman, Robert F.; and Barclay, Robert, 4,061,612, Cl. 260-31.40R.
Saunders, Jim G.; and Stucki, Alfred B., 4,061,901, Cl. 235-92.0EV.
Thomas, Charles B.: *See—*
Ryan, Arthur B.; and Thomas, Charles B., 4,060,881, Cl. 407-22.000.
Thomas, Ralph D.; and Nagle, William J., to United States of America, National Aeronautics and Space Administration. Multi-cell battery protection system. 4,061,955, Cl. 320-6.000.
Thompson, James Thomas; and Seto, Kenneth Hon, to Protective Treatments, Inc. Pressure sensitive adhesive strips and sheets. 4,061,805, Cl. 428-31.000.
Thompson, Joseph A. Vehicular energy generation system. 4,061,200, Cl. 180-66.00B.
Thompson, Wallace T. Multiple frequency band antenna. 4,062,017, Cl. 343-722.000.
Thomson-CSF: *See—*
Raverdy, Yvan; and Ploix, Jean Luc, 4,062,009, Cl. 340-324.00R.
Thornwald, Everett D., to Aerwey Laboratories, Inc. Humidifier-nebulizer apparatus. 4,061,698, Cl. 261-78.00A.
Thykeson, Audrae. Heating pad. 4,061,897, Cl. 219-211.000.
TII Corporation: *See—*
Simokat, Frank L., 4,062,054, Cl. 361-119.000.
Time Computer, Inc.: *See—*
O'Connor, Arthur H.; and McCullough, Robert E., 4,060,971, Cl. 58-4.00A.
Time/Data Corporation: *See—*
Sloane, Edwin A.; and McKeever, Bruce T., 4,061,017, Cl. 73-579.000.
Tinholt, Thomas H., to Eaton Corporation. Fluid coupling device and bimetal coil for use therein. 4,061,218, Cl. 192-58.00B.
Tobe, Akihiro: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; and Ikoma, Hidenobu, 4,061,776, Cl. 424-330.000.
Tobiki, Hisao: *See—*
Yamada, Hirotada; Okamura, Kosaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,061,748, Cl. 424-246.000.
Tobin, Charles R.: *See—*
Kashmer, James C.; and Tobin, Charles R., 4,061,160, Cl. 137-637.200.
Toft, David: *See—*
Brooksbank, Wallace Ronald; and Toft, David, 4,061,803, Cl. 427-323.000.
Togei, Ryoiku; Takei, Akira; and Wada, Kunihiko, to Fujitsu Limited. Semiconductor memory device. 4,062,037, Cl. 357-24.000.
Tohno, Katsumi: *See—*
Nomura, Hirokazu; Tohno, Katsumi; and Takahashi, Tomio, 4,061,262, Cl. 228-50.000.
Toko, Inc.: *See—*
Inokuchi, Takahiro, 4,061,992, Cl. 333-73.00R.
Tokyo Fabric Kogyo Kabushiki Kaisha: *See—*
Shimizu, Soichiro, 4,060,993, Cl. 61-43.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Matsumoto, Mitsuo, 4,061,953, Cl. 318-573.000.
Suzuki, Seigo; and Moriya, Yoshiaki, 4,062,059, Cl. 364-200.000.
Tolan, John R., to Milliken Research Corporation. Adjustable traverse tire belt winding apparatus. 4,061,524, Cl. 156-397.000.
Tomlinson, Dennis Eugene: *See—*
Reimers, Fred Alan; Beckmann, Robert Martin; Burzynski, William Arthur; Tomlinson, Dennis Eugene; and Schwartz, William Henry, 4,061,973, Cl. 325-17.000.
Tomlinson, Thomas Clifford: *See—*
Goslin, John Keith; and Tomlinson, Thomas Clifford, 4,061,148, Cl. 131-23.00R.
Tomy Kogyo Co., Inc.: *See—*
Kanno, Hideyuki, 4,061,334, Cl. 273-126.00A.
Tonne, Ronald Ray: *See—*
Campbell, Roy E.; Lawrence, John B.; and Tonne, Ronald Ray, 4,061,481, Cl. 62-29.000.
Toosbuy, Karl-Heinz Werner: *See—*
Last, Werner, 4,061,199, Cl. 180-8.00A.
Toray Industries Inc.: *See—*
Takase, Hideo; Ishii, Toyota; and Nishiumi, Shiro, 4,061,811, Cl. 428-95.000.
Toyo Rubber Industry Co., Ltd., The: *See—*
Yoshida, Akira; Kubo, Taketoshi; Yamajo, Mashayuki; and Ishigaki, Masahiro, 4,061,172, Cl. 152-379.100.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Katsuragawa, Kanzi; Hattori, Tatsuo; Kihara, Keiichi; and Tamabayashi, Hanzo, 4,061,669, Cl. 260-505.00N.
Toyoda, Kenji, to Nippon Kogaku K.K. Light measuring and indicating circuit. 4,061,431, Cl. 356-227.000.
Toyota, Hiroshi; Nagatome, Kenji; and Kawamoto, Tamio, to Nissan Motor Co., Ltd. Clutch actuating apparatus controlled by accelerator. 4,061,217, Cl. 192-.052.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Horie, Koji; and Mune, Takashi, 4,061,098, Cl. 113-116.00Q.
Kato, Shinji, 4,061,447, Cl. 418-142.000.
Konishi, Masami; and Futamura, Kazumasa, 4,060,982, Cl. 60-282.000.
Sakamaki, Hiroshi; Maeda, Toshiyuki; Sakai, Toshimitsu; and Saitou, Tadashi, 4,061,446, Cl. 418-133.000.
Takeshita, Tomon, 4,061,119, Cl. 123-119.00A.
Ueda, Masahiro, 4,061,088, Cl. 102-28.00R.
Traise, John E., to Moore Business Forms, Inc. Apparatus for applying patches to a continuous web. 4,061,527, Cl. 156-519.000.
Traister, Robert L.: *See—*
Batchelor, Phillip J.; Traister, Robert L.; Gray, Gary A.; and Marino, Joseph A., 4,062,061, Cl. 364-900.000.
Transit Products Company, Inc.: *See—*
Hixson, Richard M., 4,061,269, Cl. 238-17.000.
Trautmann, Gunther, to Index-Werke KG Hahn & Tessky. Automatic multispindle turning lathe. 4,061,060, Cl. 82-3.000.
Trefimetaux: *See—*
Moreau, Marc, 4,061,508, Cl. 148-128.000.
Trego, Allen Thomas: *See—*
Anderson, John Dale; Buller, Richard James; and Trego, Allen Thomas, 4,060,961, Cl. 56-294.000.
Trifonova, Rimma Petrovna: *See—*
Bart, Evgeny Vasilievich; Batalin, Oleg Efimovich; Troitsky, Andrian Petrovich; Skachkova, Nina Andreevna; Lebedev, Vladimir Mikhailovich; and Trifonova, Rimma Petrovna, 4,061,680, Cl. 260-606.000.
Troitsky, Andrian Petrovich: *See—*
Bart, Evgeny Vasilievich; Batalin, Oleg Efimovich; Troitsky, Andrian Petrovich; Skachkova, Nina Andreevna; Lebedev, Vladimir Mikhailovich; and Trifonova, Rimma Petrovna, 4,061,680, Cl. 260-606.000.
Trost, Wilfried: *See—*
Madaus, Rolf Hermann Heinrich; Halbach, Gunter; and Trost, Wilfried, 4,061,765, Cl. 424-278.000.
Trotter, George H. Bowstring positioning device. 4,061,125, Cl. 124-24.00R.
TRW Inc.: *See—*
Petrelis, Peter G., 4,061,989, Cl. 333-7.00R.
Tseluiko, Jury Ivanovich: *See—*
Andoniev, Sergei Mikhailovich; Granovsky, Boris Ruvimovich; Golod, Leonid Davydovich; Kudinov, Gennady Alexandrovich; Kasyanov, Grigory Ivanovich; Filipiev, Oleg Vladimirovich; Tseluiko, Jury Ivanovich; and Lysenko, Evgeny Eliseevich, 4,061,317, Cl. 266-193.000.
Tsubakinoto Chain Company: *See—*
Yamasaki, Akitosi; Fukuyama, Kiyoshi; and Miyauchi, Kazunori, 4,061,311, Cl. 254-168.000.
Tsujimoto, Kayoshi: *See—*
Kobori, Toshio; Tsujimoto, Kayoshi; Nanba, Yasuhiro; and Yamada, Seiji, 4,062,023, Cl. 354-38.000.
Tsunekawa, Tokuichi; Uchidoi, Masanori; Shimizu, Masami; Yamamichi, Masayoshi; Murayama, Keiya; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Control system consisting of semi-conductor integrated circuits for a camera. 4,062,024, Cl. 354-60.00R.
Tucker, John A. Combination container with removable closure. 4,061,244, Cl. 220-310.000.
Tucker, Lee Everett: *See—*
Dunn, James Knox, III; Tucker, Lee Everett; and Redman, Andrew Paul, 4,061,167, Cl. 144-34.00E.
Tupper, David Edward: *See—*
Chakrabarti, Jiban Kumar; Hotten, Terrence Michael; and Tupper, David Edward, 4,061,774, Cl. 424-325.000.
Turner, Brian Maurice: *See—*
Duffield, Peter Roe; Flockton, Peter Robin; Lillis, Rupert Martin; Turner, Brian Maurice; and Crowell, Donald Edward, 4,061,706, Cl. 264-90.000.
Turner, Mervyn Edward Dennant, to Imperial Chemical Industries Limited. Process for separating an acid from a gaseous mixture. 4,061,714, Cl. 423-220.000.
Tuttle, Glenn L., to Sandoz, Inc. Apparatus for controlling blood flow. 4,061,142, Cl. 128-214.00R.
Tyco Filters Division, Inc.: *See—*
Bottom, Virgil E.; and Christian, Robert E., 4,060,888, Cl. 29-628.000.
Tyler, Wesley R.: *See—*
Deffeyes, Robert J.; and Tyler, Wesley R., 4,061,824, Cl. 428-328.000.

Uchidoi, Masanori: *See—*
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,062,028, Cl. 354-152.000.
Tsunekawa, Tokuichi; Uchidoi, Masanori; Shimizu, Masami; Yamamichi, Masayoshi; Murayama, Keiya; and Aizawa, Hiroshi, 4,062,024, Cl. 354-60.00R.

Uchino, Misao: *See—*
Natori, Minoru; Hatuse, Toshikazu; Kawanobe, Kouhei; Ogawa, Hiroshi; Sekiya, Fukuo; Ebihara, Heihachiro; and Uchino, Misao, 4,060,974, Cl. 58-23.00R.

Udovenko, Vitaly Kirillovich: *See—*
Kaporovich, Vladimir Georgievich; Sereda, Viktor Grigorievich; Udovenko, Vitaly Kirillovich; Zelenskaya, Nadezhda Nikolaevna; Brazhnik, Viktor Yakovlevich; Sviridov, Evgeny Pavlovich; and Fabrichev, Jury Nikolaevich, 4,061,009, Cl. 72-69.000.

Ueda, Masahiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Electric detonating fuse assembly. 4,061,088, Cl. 102-28.00R.

Uelzmann, Heinz: *See—*
Fabris, Hubert J.; Gruber, David P.; Sponseller, David R.; and Uelzmann, Heinz, 4,061,845, Cl. 526-11.100.

Ueno, Tomoki, to Matsushita Electric Industrial Co., Ltd. Frequency combining circuit. 4,061,990, Cl. 333-10.000.

UFI Engineering & Manufacturing Co., Inc.: *See—*
Miksitz, Frank J., 4,061,246, Cl. 222-1.000.

Ugine Aciers: *See—*
Chave, Henri, 4,061,433, Cl. 403-359.000.

Uncle Ben's of Australia Pty. Ltd.: *See—*
Warren, Gregory Noel, 4,061,789, Cl. 426-250.000.

Unelec S.A.: *See—*
Hennemann, Jean, 4,061,993, Cl. 335-20.000.

Union Carbide Canada Limited: *See—*
Gosling, Lincoln John; and Fraser, Graham, 4,060,875, Cl. 17-1.00F.

Union Carbide Corporation: *See—*
Berger, Sidney Ethan; and Salensky, George Anthony, 4,061,503, Cl. 106-300.000.
Grose, Robert William; and Flanigen, Edith Marie, 4,061,724, Cl. 423-335.000.
Higgins, Thomas Engel, 4,061,787, Cl. 426-140.000.
Kiyonaga, Kazuo, 4,061,487, Cl. 65-135.000.
Lindbergh, Jon M., 4,061,387, Cl. 294-26.000.
Moore, Arthur William; Volk, Herbert Franz; and Merrow, Jack Kenneth, 4,061,600, Cl. 252-510.000.

Uniroyal, Ltd.: *See—*
Washburn, Owen Victor; Kouvarellis, Georgeos Konstandenos; and Ferguson, William Alexander, 4,061,565, Cl. 210-32.000.

United Air Specialists, Inc.: *See—*
Baker, Forester C., 4,061,961, Cl. 323-21.000.

United Kingdom Atomic Energy Authority: *See—*
Green, Derek, deceased; and Green, Muriel Irene, executrix, 4,061,011, Cl. 72-262.000.
Jackson, George Oliver, 4,061,534, Cl. 176-37.000.

United States of America
Agriculture: *See—*
Cary, John W.; and Heinemann, William H., Jr., 4,061,094, Cl. 111-89.000.
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Chew, William M.; Ayers, Orval E.; Murfree, James A.; and Martignoni, Pasquale, 4,061,512, Cl. 149-22.000.
Evans, David G., 4,061,842, Cl. 429-116.000.
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Bell, Charles H., 4,061,577, Cl. 250-199.000.
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Baczuk, Robert J., 4,061,511, Cl. 149-19.900.
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Perkins, Donald W.; and Smith, Marvin W., 4,062,057, Cl. 363-71.000.
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Mollendorf, Ralf; and Lux, Peter, 4,061,920, Cl. 250-413.000.
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Tanaka, Sadaharu; Saito, Sadayuki; and Hirano, Sensaburo, 4,061,319, Cl. 266-281.000.
Wandrisco, Joseph M., 4,061,270, Cl. 238-107.000.

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Willenbecher, James F.; and Armstrong, Lee R., 4,061,025, Cl. 73-116.000.

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Fridley, Robert B.; Chen, Pictiaw; Mehlschau, James J.; and Claypool, Lawrence L., 4,061,020, Cl. 73-81.000.

UOP Inc.: *See—*
Hilfman, Lee, 4,061,563, Cl. 208-111.000.
Morgan, Kenneth A.; and Frame, Robert R., 4,061,711, Cl. 423-67.000.
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Hall, Charles M.; and Wright, John B., 4,061,791, Cl. 424-304.000.
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Robert, Andre, 4,061,742, Cl. 424-234.000.
Van Rheenen, Verlan H., 4,061,657, Cl. 260-343.30P.

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Miyoshi, Munetsugu; Matsumoto, Kazuo; Urabe, Yuji; and Iwasaki, Tameo, 4,061,650, Cl. 260-307.00F.

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Brown, Lowell K.; Newman, William Albert; and Boyd, William A., 4,061,956, Cl. 320-22.000.

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Miller, Carl W.; Vandenberg, Lester C.; and Statt, Wayne H., 4,061,709, Cl. 264-293.000.

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Pelletier, Ronald R.; Hansen, Robert D.; and Vanderbush, James J., 4,061,833, Cl. 428-511.000.

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Richardson, James L., 4,061,273, Cl. 239-172.000.

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Krenzer, John, 4,061,648, Cl. 260-/306.80D.

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Jaeger, Heimo, 4,061,493, Cl. 75-10.00C.

Verger, Bernard: *See—*
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Kayanuma, Kanji, 4,061,950, Cl. 318-314.000.
Matsumoto, Shigeru, 4,061,378, Cl. 312-20.000.

Victor United, Inc.: *See—*
Groner, Norman Arlo, 4,061,124, Cl. 124-23.00R.

Villaloboz, Arthur A., to Smith International Inc. Rock bit bearing structure. 4,061,376, Cl. 308-8.200.

Villax, Ivan. Recovery of doxycycline and products thereof. 4,061,676, Cl. 260-559.0AT.

Violette, Theodore T. Drum supporting carriage. 4,061,391, Cl. 296-4.000.

Vivat, Michel: *See—*
Martel, Jacques; Buendia, Jean; and Vivat, Michel, 4,061,729, Cl. 424-305.000.

Vock, Manfred Hugo: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,061,795, Cl. 426-535.000.
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Vodin, George M. Tonneau cover for recreational vehicle. 4,061,394, Cl. 296-100.000.

Vogel, Ralph A., to Essex Group, Inc. Speed control system for continuous strip manufacturing apparatus. 4,061,947, Cl. 318-77.000.

Volk, Herbert Franz: *See—*
Moore, Arthur William; Volk, Herbert Franz; and Merrow, Jack Kenneth, 4,061,600, Cl. 252-510.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Bufler, Ernst, 4,061,362, Cl. 280-689.000.
Wenninger, Josef, 4,061,054, Cl. 74-552.000.

Vollmer, Hartfrid; Dany, Franz-Josef; and Wortmann, Joachim, to Hoechst Aktiengesellschaft. Diphosphates. 4,061,696, Cl. 260-930.000.

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von Holdt, John W. Apparatus for molding an insert member in a frame member. 4,061,455, Cl. 425-112.000.

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Weiler, Herbert; Schneider, Hans; Von Janecek, Wolfgang; and Weyrich, Ludwin, 4,060,911, Cl. 34-5.000.

Vorley, Geoffrey: *See—*
Dinsdale, Jack; McQue, David Wallace; and Vorley, Geoffrey, 4,061,952, Cl. 318-572.000.

Vostovich, Joseph Edward: *See—*
Rothenberg, Sidney; and Vostovich, Joseph Edward, 4,061,703, Cl. 264-36.000.

Vota, Terry L.: *See—*
Goel, Rajeshwar P.; Vota, Terry L.; and Lynch, Thomas J., 4,061,937, Cl. 310-65.000.

W. A. Whitney Corporation: *See—*
Kindgren, Lee; and Swanson, James P., 4,061,064, Cl. 83-368.000.

W. R. Grace & Co.: *See—*
Guthrie, James Leverette; and Dighe, Shrikant Vishwanath, 4,061,864, Cl. 560-26.000.
Marans, Nelson Samuel; and Gluecksmann, Alfred, 4,061,662, Cl. 560-26.000.

Wada, Kunihiko: *See—*
Togei, Ryoiku; Takei, Akira; and Wada, Kunihiko, 4,062,037, Cl. 357-24.000.

Wade, Jackie F., to Martin Marietta Corporation. High resolution aiignment interferometer. 4,061,425, Cl. 356-110.000.

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Fitzgerald, James J.; Fortunato, Joseph J.; and Demas, Nickolas P., 4,061,940, Cl. 313-318.000.

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Walchuk, Thomas S. Apparatus and method for protecting wheel move irrigation systems with electrified fence. 4,061,312, Cl. 256-10.000.

Waldo, Russell W., to Ideal Security Hardware Corporation. Automatically locking crossbolt deadlock. 4,061,383, Cl. 292-335.000.

Walker, Andrew M.; and Gabbard, Ova Gene, to Digital Communications Corporation. Phase locked loop with pre-set and squelch. 4,061,979, Cl. 325-419.000.

Walker, William J.; and Boulay, Henri A., to Leesona Corporation. Easy access-low noise granulator. 4,061,282, Cl. 241-222.000.

Walker, William T., to Hewlett-Packard Co. Constant power rating power supply. 4,061,958, Cl. 363-81.000.

Wallhausser, Hermann: *See—*
Schafer, Werner; Busch, Wolfram; Wallhausser, Hermann; Richter, Manfred; and Wilhelm, Siegfried, 4,061,710, Cl. 264-300.000.

Wandrisco, Joseph M., to United States Steel Corporation. Steel tie insulating saddle. 4,061,270, Cl. 238-107.000.

Ward, Edwin J. Gutter manipulating apparatus and method. 4,061,151, Cl. 134-33.000.

Ward, Walter Henry: *See—*
Metcalfe, Edward Geoffrey; and Ward, Walter Henry, 4,061,359, Cl. 280-638.000.

Ware, Maximilian. Racing paddle and method of making the same. 4,061,106, Cl. 115-24.100.

Warner, Joe Frank. Two cylinder shock absorber system. 4,061,320, Cl. 267-64.00R.

Warner-Lambert Company: *See—*
Satzinger, Gerhard; and Herrmann, Manfred Franz, 4,061,635, Cl. 544-172.000.
Wise, Lawrence D.; and Morrison, Glenn C., 4,061,636, Cl. 260-250.00P.

Warren, Gregory Noel, to Uncle Ben's of Australia Pty. Ltd. Process of simulating a lean and fat meat product. 4,061,789, Cl. 426-250.000.

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Washburn, Owen Victor; Kouvarellis, Georgeos Konstandenos; and Ferguson, William Alexander, to Uniroyal, Ltd. Sorption of weak organic acids from water by polyurethane. 4,061,565, Cl. 210-32.000.

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Watanabe, Satoshi: *See—*
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,062,028, Cl. 354-152.000.

Watashiro, Seiichi: *See—*
Sato, Fumio; Sakamoto, Teruo; Watashiro, Seiichi; Inoue, Hayao; and Yahata, Yoshihito, 4,061,164, Cl. 141-90.000.

Watson, James M., to Cosden Technology, Inc. Polymerization inhibitor for vinyl aromatic compounds. 4,061,545, Cl. 203-9.000.

Watts, Claude H., to Precision Metalsmiths, Inc. Pattern assembly and method of making the same. 4,061,175, Cl. 164-45.000.

Wawretschek, Lothar: *See—*
Wawretschek, Wolfgang; and Wawretschek, Lothar, 4,061,741, Cl. 424-232.000.

Wawretschek, Wolfgang; and Wawretschek, Lothar, to Servomed Arzei GmbH & Co. Pharma KG, Firma. Physiological substances for intensifying the pharmacological effect of drugs. 4,061,741, Cl. 424-232.000.

Way, Frederick L. Battery spark suppression circuit. 4,062,051, Cl. 361-6.000.

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Fish, Frank L., 4,061,015, Cl. 73-49.500.
Weaver, Leslie A.: *See*—
Kingman, Stephen A.; and Weaver, Leslie A., 4,061,353, Cl. 280-106.00T.
Weber, Donald William, to Ampex Corporation. Tape timing apparatus and method employing a phase comparison between sequential pulse trains. 4,062,048, Cl. 360-72.000.
Wehinger, Egbert: *See*—
Horstmann, Harald; Meng, Karl; and Wehinger, Egbert, 4,061,653, Cl. 548-360.000.
Weidenbach, Guenter; Lecloux, Andre; and Gobillon, Yves, to Kali-Chemie Aktiengesellschaft. Purification of exhaust gases. 4,061,713, Cl. 423-213.500.
Weigers, Wilhelmus Johannen: *See*—
Hall, John B.; and Weigers, Wilhelmus Johannen, 4,061,686, Cl. 260-631.00R.
Weigert, Frank Julian, to Du Pont de Nemours, E. I., and Company. Catalytic synthesis of phenols. 4,061,685, Cl. 260-621.00G.
Weil, Rudolf: *See*—
Dorner, Friedrich; Scriba, Marianne; and Weil, Rudolf, 4,061,538, Cl. 195-29.000.
Weiler, Herbert; Schneider, Hans; Von Janecek, Wolfgang; and Weyrich, Ludwin, to Behringwerke Aktiengesellschaft. Process for the preparation of a container closed under sterile conditions and containing lyophilized material. 4,060,911, Cl. 34-5.000.
Weiss, Martin Joseph: *See*—
Floyd, Middleton Brawner, Jr.; Weiss, Martin Joseph; Grudzinskas, Charles Vincent; and Lai Chen, Sow-Mei, 4,061,670, Cl. 260-514.00D.
Floyd, Middleton Brawner, Jr.; McGahren, William James; Schaub, Robert Eugene; and Weiss, Martin Joseph, 4,061,672, Cl. 260-514.00D.
Welsh, Howard: *See*—
Bennett, John A.; McAllister, Ian R.; and Welsh, Howard, 4,061,569, Cl. 210-83.000.
Welter, Clarence L.: *See*—
Clancy, John F.; and Welter, Clarence L., 4,061,896, Cl. 200-323.000.
Wenninger, Josef, to Volkswagenwerk Aktiengesellschaft. Steering wheel. 4,061,054, Cl. 74-552.000.
Werner, Wolfgang: *See*—
Lange, Hans; Rittersdorf, Walter; Rey, Hans-Georg; Werner, Wolfgang; and Rieckmann, Peter, 4,061,468, Cl. 23-253.0TP.
Wessman, Elbert F., to National Can Corporation. Drawing and ironing machine with positive cup feeder. 4,061,012, Cl. 72-347.000.
Westinghouse Electric Corporation: *See*—
Fey, Maurice G.; and Dancy, Edna A., 4,061,492, Cl. 75-10.00R.
Goel, Rajeshwar P.; Vota, Terry L.; and Lynch, Thomas J., 4,061,937, Cl. 310-65.000.
Green, John W., 4,061,963, Cl. 323-43.50R.
McCaskey, Harold O., Jr.; and Palazzolo, Salvatore E., 4,061,823, Cl. 42b-318.000.
Westman, Morton Alan: *See*—
Oberstar, Helen Elizabeth; and Westman, Morton Alan, 4,061,602, Cl. 252-547.000.
Weston, Norma Ann: *See*—
Hillard, Ray Leonard; and Weston, Norma Ann, 4,061,681, Cl. 260-606.50P.
Wettstein, Eugen: *See*—
Vaeth, Guenter; Ohlinger, Manfred; Stritzinger, Heinz; Schoenafinger, Eduard; Wettstein, Eugen; and Guth, Wolfgang, 4,061,727, Cl. 423-634.000.
Weyerhaeuser Company: *See*—
Gillern, Maurice F., 4,061,620, Cl. 260-29.300.
Weyrich, Ludwin: *See*—
Weiler, Herbert; Schneider, Hans; Von Janecek, Wolfgang; and Weyrich, Ludwin, 4,060,911, Cl. 34-5.000.
Whicker, Bobbie Dean: *See*—
Raisbeck, Wesley Paul; Bass, Merlyn Duane; Whicker, Bobbie Dean; Davis, William Clair; and Fairbank, Raymond Harry, 4,061,284, Cl. 241-294.000.
Whirlpool Corporation: *See*—
Drews, Reinhold Alvin, 4,061,002, Cl. 68-212.000.
White, William Page; and Hawkins, Kenneth Robert, to Cincinnati Milacron, Inc. Hood adjusting apparatus. 4,060,942, Cl. 51-268.000.
Whitehouse, Sydney Robert: *See*—
Counsell, Patrick James Claude; and Whitehouse, Sydney Robert, 4,061,825, Cl. 428-355.000.
Whitmore, Jack: *See*—
Nash, Harold Garth; and Whitmore, Jack, 4,061,885, Cl. 179-84.0VF.
Whitney, James C., to Dictaphone Corporation. Bi-directional rotary drive mechanism. 4,061,292, Cl. 242-201.000.
Whitney, Richard P., to Sivyer Steel Corporation. Shredder with grate cartridge. 4,061,277, Cl. 241-73.000.
Whittlesey, James W.: *See*—
Rajasekaran, Ramanujam; Taylor, Dennis O.; and Whittlesey, James W., 4,061,187, Cl. 165-107.000.
Wick, Raymond V.: *See*—
Goranson, Rex W.; and Wick, Raymond V., 4,061,917, Cl. 250-338.000.
Widl, Walter Herbert Erwin, to Telefonaktiebolaget L M Ericsson. Method and apparatus for generating a number of weakly correlated pseudorandom pulse trains. 4,061,881, Cl. 179-15.0BF.
Widran, Jerrold; and Solin, Stuart A., to Widran, Jerrold. Binocular endoscope. 4,061,135, Cl. 128-6.000.
Wiech, Norbert L.: *See*—
Blohm, Thomas R.; Grisar, J. Martin; and Wiech, Norbert L., 4,061,746, Cl. 424-244.000.
Wiechert, Rudolf; Kerb, Ulrich; and Engelfried, Otto, to Schering Aktiengesellschaft. $\Delta^{9(11)}$-5α-20-keto steroids and process for their production. 4,061,661, Cl. 260-397.450.
Wiggins Teape Limited: *See*—
Allen, Roger Anthony, 4,061,109, Cl. 118-118.000.
Wild, Hans; Jung, Rudolf; Echte, Adolf; Zizlsperger, Johann; and Gausepohl, Hermann, to BASF Aktiengesellschaft. Purifying acrylonitrile for the manufacture of acrylonitrile polymers. 4,061,858, Cl. 526-67.000.
Wiley, Robert Emerson: *See*—
Clary, Jerome Francis; Wiley, Robert Emerson; and Bowns, Richard Earl, 4,061,601, Cl. 252-511.000.
Wilhelm, Siegfried: *See*—
Schafer, Werner; Busch, Wolfram; Wallhausser, Hermann; Richter, Manfred; and Wilhelm, Siegfried, 4,061,710, Cl. 264-300.000.
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Wilkinson, Alvin H. Safety becket. 4,061,388, Cl. 294-82.00R.
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Willey, Arthur F.: *See*—
Fiedler, Edgar F.; Copas, Gordon A.; and Willey, Arthur F., 4,060,959, Cl. 53-373.000.
William H. Rorer, Inc.: *See*—
Diamond, Julius; and Douglas, George H., 4,061,771, Cl. 424-304.000.
Williams Patent Crusher and Pulverizer Company: *See*—
Williams, Robert M., 4,061,274, Cl. 241-24.000.
Williams, Robert M., to Williams Patent Crusher and Pulverizer Company. Material reducing apparatus and method of operating the same. 4,061,274, Cl. 241-24.000.
Wilson, Clifford Arthur, to Rotocrop International, Ltd. Compost bin. 4,060,945, Cl. 52-169.500.
Wilson, Melvin A. Solar furnace heating system. 4,061,129, Cl. 126-270.000.
Wincanton Engineering Limited: *See*—
Charles, George Kenneth, 4,061,794, Cl. 426-486.000.
Windle, William, to English Clays Lovering Pochin & Company Limited. Ball clay. 4,061,502, Cl. 106-72.000.
Windmolier & Holscher: *See*—
Mundus, Friedhelm; and Schneider, Horst, 4,061,458, Cl. 425-392.000.
Wingard Limited: *See*—
Cunningham, Douglas James, 4,061,291, Cl. 242-107.000.
Winkler, Bruno; Mangei, Bernd; and Fritz, Dieter, to Naturin-Werk Becker & Co. Dyed edible food casings. 4,061,786, Cl. 426-138.000.
Winstel, Guenter, to Siemens Aktiengesellschaft. Luminescent diode. 4,062,035, Cl. 357-17.000.
Winston, Emanuel A. Irrigation device. 4,061,272, Cl. 239-145.000.
Wintzer, Klaus, to Siemens Aktiengesellschaft. Method and apparatus for transmitting digital information signals from signal transmitters to signal receivers over switching apparatus. 4,061,879, Cl. 179-15.0BA.
Wirth, Hanns: *See*—
Hannig, Kurt; and Wirth, Hanns, 4,061,560, Cl. 204-299.00R.
Wise, Lawrence D.; and Morrison, Glenn C., to Warner-Lambert Company. Naphthalenone phthalazinylhydrazones. 4,061,636, Cl. 260-250.00P.
Wittenberg, Albert J.: *See*—
Geurts, Petrus T. J.; and Wittenberg, Albert J., 4,061,422, Cl. 350-293.000.
Witzel, Bruce E.: *See*—
Dybas, Richard A.; Grier, Nathaniel; and Witzel, Bruce E., 4,061,775, Cl. 424-330.000.
Witzke, Gunther; and Baumgartner, Hans Ulrich, to Kistler Instrumente AG. Diaphragm arrangement for pressure transducers. 4,061,035, Cl. 73-406.000.
Wolf, Erhard: *See*—
Ertel, Hartmut; Heubach, Gunther; and Wolf, Erhard, 4,061,767, Cl. 424-282.000.
Wolverine Aluminum Corporation: *See*—
DeSantis, Raymond P., 4,061,452, Cl. 425-78.000.
DeSantis, Raymond P., 4,061,453, Cl. 425-78.000.
Wommack, Malcolm R. Worm detection process. 4,061,788, Cl. 426-248.000.
Wood, Derek A., to Shell Oil Company. Preparation of phenoxybenzyl esters. 4,061,664, Cl. 260-465.00D.
Wood, Ernest C.: *See*—
Samuels, Peter B.; and Wood, Ernest C., 4,061,134, Cl. 128-1.00R.
Wood, Samuel F.: *See*—
Kasson, James M.; and Wood, Samuel F., 4,061,887, Cl. 179-99.000.
Wood, William H., to Airheart Products, Inc. Bicycle brake. 4,061,206, Cl. 188-26.000.

Woodstream Corporation: *See*—
Woolworth, Richard G., 4,060,864, Cl. 9-6.00M.
Woolworth, Richard G., 4,060,865, Cl. 9-6.00M.
Woodward, Oakley McDonald; and Siukola, Matti Solmu Olavi, to RCA Corporation. Low cost linear/circularly polarized antenna. 4,062,019, Cl. 343-797.000.
Woolley, Lee A., to Scott & Fetzer Co., The. Synchronous motor. 4,061,936, Cl. 310-41.000.
Woolworth, Richard G., to Woodstream Corporation. Boat construction incorporating flotation means. 4,060,864, Cl. 9-6.00M.
Woolworth, Richard G., to Woodstream Corporation. Boat construction incorporating flotation means. 4,060,865, Cl. 9-6.00M.
Wortmann, Joachim: *See*—
Vollmer, Hartfrid; Dany, Franz-Josef; and Wortmann, Joachim, 4,061,696, Cl. 260-930.000.
Wright, John B.: *See*—
Hall, Charles M.; and Wright, John B., 4,061,791, Cl. 424-304.000.
Wright, Walter J.: *See*—
Sharma, Ram A.; Wright, Walter J.; and Murie, Richard A., 4,061,841, Cl. 429-112.000.
Wulf, Horst-Dieter: *See*—
Kaufhold, Manfred; and Wulf, Horst-Dieter, 4,061,687, Cl. 260-632.0HF.
Wynne, Francis Edmund, Jr.: *See*—
McKinney, Joel Drexler; Sebulsky, Raynor T.; and Wynne, Francis Edmund, Jr., 4,061,562, Cl. 208-61.000.
Wynveen, Richard A.: *See*—
United States of America, National Aeronautics and Space Administration; Wynveen, Richard A.; Powell, James D.; and Schubert, Franz H., 4,061,570, Cl. 210-96.00M.
Xerox Corporation: *See*—
Batchelor, Phillip J.; Traister, Robert L.; Gray, Gary A.; and Marino, Joseph A., 4,062,061, Cl. 364-900.000.
Price, Edgar Elmer; and Spurles, Louise Leone, 4,061,419, Cl. 350-184.000.
Yahata, Yoshihito: *See*—
Sato, Fumio; Sakamoto, Teruo; Watashiro, Seiichi; Inoue, Hayao; and Yahata, Yoshihito, 4,061,164, Cl. 141-90.000.
Yamada, Hirotada; Okamura, Kosaku; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, to Sumitomo Chemical Company, Limited. 7-(α-(4-Hydroxy-1,5-naphthyridine-3-carbonamido)-α-phenylacetamido) cephalosporin derivatives. 4,061,748, Cl. 424-246.000.
Yamada, Seiji: *See*—
Kobori, Toshio; Tsujimoto, Kayoshi; Nanba, Yasuhiro; and Yamada, Seiji, 4,062,023, Cl. 354-38.000.
Yamaguchi, Sizuo, to Citizen Watch Company Limited. Method and apparatus for driving electrochromic display device. 4,060,975, Cl. 58-50.00R.
Yamajo, Mashayuki: *See*—
Yoshida, Akira; Kubo, Taketoshi; Yamajo, Mashayuki; and Ishigaki, Masahiro, 4,061,172, Cl. 152-379.100.
Yamamichi, Masayoshi: *See*—
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,062,028, Cl. 354-152.000.
Tsunekawa, Tokuichi; Uchidoi, Masanori; Shimizu, Masami; Yamamichi, Masayoshi; Murayama, Keiya; and Aizawa, Hiroshi, 4,062,024, Cl. 354-60.00R.
Yamamoto, Takashi: *See*—
Yoshida, Moritoshi; Yamamoto, Takashi; and Nii, Sumito, 4,061,780, Cl. 424-358.000.
Yamane, Mamoru: *See*—
Ozaki, Hiromi; Yamane, Mamoru; Kodama, Hachio; and Yoshika, Haruo, 4,061,472, Cl. 44-1.00R.
Yamasaki, Akitosi; Fukuyama, Kiyoshi; and Miyauchi, Kazunori, to Tsubakinoto Chain Company. Air hoist and its control device. 4,061,311, Cl. 254-168.000.
Yamatsu, Isao: *See*—
Kijima, Shizumasa; Yamatsu, Isao; Minami, Norio; and Inai, Yuichi, 4,061,660, Cl. 260-396.00R.
Yanagawa, Nobuyuki, to Ricoh Co., Ltd. Sheet separator for use in electrophotographic copying machines. 4,061,330, Cl. 271-174.000.
Yanick, Paul, Jr.: *See*—
Freifeld, Stephen; and Yanick, Paul, Jr., 4,061,875, Cl. 179-1.00P.
Yanmar Diesel Engine Co., Ltd.: *See*—
Fukushima, Tsugio, 4,060,985, Cl. 60-319.000.
Yasuda, Shigeyuki: *See*—
Nishino, Tetsuya; and Yasuda, Shigeyuki, 4,061,785, Cl. 426-124.000.
Yates, Robert W., to Redken Laboratories, Inc. Hair testing apparatus. 4,061,022, Cl. 73-95.000.
Yazaki, Hitoshi: *See*—
Yoshiike, Kiwamu; and Yazaki, Hitoshi, 4,061,307, Cl. 251-315.000.
Yokoi, Hiroshi; and Akagawa, Masataka, to Kokusai Denshin Denwa Kabushiki Kaisha. Scanning antenna with moveable beam waveguide feed and defocusing adjustment. 4,062,018, Cl. 343-754.000.
Yokokawa, Takao; Kanazawa, Shogo; Otoguro, Yasuo; Suzuki, Nobukazu; Akase, Sigeyuki; Miida, Noboru; Akazawa, Tadahisa; and Kuroiwa, Kazuya, to Nippon Steel Corporation. Free-cutting graphitic steel. 4,061,494, Cl. 75-124.000.
Yonezawa, Toshiaki: *See*—
Shigemori, Youjiro; Mitumori, Yoshio; and Yonezawa, Toshiaki, 4,062,050, Cl. 360-30.000.
Yoshida, Akira; Kubo, Taketoshi; Yamajo, Mashayuki; and Ishigaki, Masahiro, to Toyo Rubber Industry Co., Ltd., The. Assembly of pneumatic tire and rim. 4,061,172, Cl. 152-379.100.
Yoshida, Fumihiko; Mizusawa, Kiyoshi; and Nakamura, Kazuo, to Kikkoman Shoyu Co., Ltd. Cholesterol oxidaze and process for preparing same. 4,061,540, Cl. 195-62.000.
Yoshida, Moritoshi; Yamamoto, Takashi; and Nii, Sumito, to Nichiyu Kagaku Co., Ltd. Cosmetic oil containing isobutylene. 4,061,780, Cl. 424-358.000.
Yoshida, Takashi, to Nippon Gakki Seizo Kabushiki Kaisha. Junction field effect transistor of vertical type. 4,062,036, Cl. 357-22.000.
Yoshida, Tokuzo: *See*—
Yoshida, Toru; Hosoi, Kameo; Yoshida, Tokuzo; Shimizu, Kazuyuki; and Nakagawa, Koithiro, 4,060,913, Cl. 34-80.000.
Yoshida, Toru; Hosoi, Kameo; Yoshida, Tokuzo; Shimizu, Kazuyuki; and Nakagawa, Koithiro, to Takasago Thermal Engineering Co., Ltd; and Nippon Steel Corporation. Assembly for dehydrating air to be supplied to blast furnace. 4,060,913, Cl. 34-80.000.
Yoshiike, Kiwamu; and Yazaki, Hitoshi, to Kitazawa Shoji Kabushiki Kaisha. Ball valve. 4,061,307, Cl. 251-315.000.
Yoshika, Haruo: *See*—
Ozaki, Hiromi; Yamane, Mamoru; Kodama, Hachio; and Yoshika, Haruo, 4,061,472, Cl. 44-1.00R.
Yoshioka, Takao: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; and Kurumada, Tomoyuki, 4,061,616, Cl. 260-45.80N.
Young, Jonathan D.; and Caldecott, Ross, to Ohio State University, The. Underground pipe detector. 4,062,010, Cl. 343-5.0NA.
Young, Steven H. Tone arms. 4,061,342, Cl. 274-23.00A.
Youngquist, Rudolph William, to Procter & Gamble Company, The. Shaped textured protein food product. 4,061,784, Cl. 426-93.000.
Yugen Kaisha Watanabe Kenkyusho: *See*—
Watanabe, Katsumi, 4,061,343, Cl. 274-24.00R.
Yukinaga, Hisajiro; Kano, Hideo; and Ogata, Masaru, to Shionogi & Co., Ltd. Post-harvest plant preserving compositions. 4,061,490, Cl. 71-68.000.
Yundt, Albert P., to Bard Laboratories, Inc. Thermographic recording system. 4,061,836, Cl. 428-537.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Ohno, Masaji; and Kataoka, Mutsuo, 4,061,769, Cl. 424-283.000.
Zaininger, Henry W.: *See*—
Finigan, George D.; May, Brian E.; and Zaininger, Henry W., 4,060,916, Cl. 35-10.000.
Zall, Robert R.; Sobel, A. Theodore; and Price, Donald R., to Cornell Research Foundation, Inc. Apparatus for cleaning automatic milking machines. 4,061,504, Cl. 134-95.000.
Zeidler, Guenter; and Auracher, Franz, to Siemens Aktiengesellschaft. Apparatus for distributing light signals among a plurality of receivers. 4,062,043, Cl. 358-86.000.
Zelenskaya, Nadezhda Nikolaevna: *See*—
Kaporovich, Vladimir Georgievich; Sereda, Viktor Grigorievich; Udovenko, Vitaly Kirillovich; Zelenskaya, Nadezhda Nikolaevna; Brazhnik, Viktor Yakovlevich; Sviridov, Evgeny Pavlovich; and Fabrichev, Jury Nikolaevich, 4,061,009, Cl. 72-69.000.
Zemchenko, Alexandr Mikhailovich: *See*—
Lifshits, Viktor Senderovich; Petrov, Georgy Nikolaevich; Papkov, Oleg Sergeevich; Khomenko, Vladimir Ivanovich; Gerasimenko, Alexandr Yakovlevich; Taradaiko, Alexandr Korneevich; Zemchenko, Alexandr Mikhailovich; and Gremyakov, Ivan Petrovich, 4,061,078, Cl. 90-24.00C.
Zielinski, Eugene J., to Owens-Illinois, Inc. Method of forming flexible electrical circuit connections. 4,060,889, Cl. 29-628.000.
Zipay, Albert John: *See*—
Guido, Paul Vincent; Criswell, Robert Lenox; and Zipay, Albert John, 4,060,990, Cl. 60-676.000.
Zirwas, Johann Gerhard, to Siemens Aktiengesellschaft. Transistor power amplifier for transmitting systems. 4,061,984, Cl. 330-149.000.
Zizlsperger, Johann: *See*—
Wild, Hans; Jung, Rudolf; Echte, Adolf; Zizlsperger, Johann; and Gausepohl, Hermann, 4,061,858, Cl. 526-67.000.
Zuckerwar, Allan J.: *See*—
United States of America, National Aeronautics and Space Administration; and Zuckerwar, Allan J., 4,061,041, Cl. 73-646.000.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 66,272	4,014,978	Feb. 24, 1976	Mar. 29, 1977	B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977	B 373,344	4,053,067	Feb. 3, 1976	Oct. 11, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977	B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 159,570	4,036,870	Mar. 23, 1976	July 19, 1977	B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977	B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977	B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977	B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976	B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976	B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977	B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977	B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976	B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976	B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977	B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976	B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977	B 441,789	4,001,449	Mar 30, 1976	Jan. 4, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976	B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976	B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976	B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977	B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976	B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976	B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977	B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977	B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976	B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976	B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977	B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976	B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976	B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976	B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976	B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976	B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976	B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 424,410	4,021,196	Mar. 30, 1976	May 3, 1977	B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976	B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977	B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977	B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976	B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976	B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977	B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976	B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976	B 449,989	4,061,572	Mar. 30, 1976	Dec. 6, 1977
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977	B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976	B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976	B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976	B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977	B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976	B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977	B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 433,892	4,016,061	Apr. 6, 1976	Apr. 5, 1977	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976	B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976	B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977	B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976	B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977	B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976	B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976	B 475,801	4,056,759	Mar. 30, 1976	Nov. 1, 1977
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977	B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976	B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976	B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976	B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976	B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977	B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976	B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976	B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977	B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 461,752	4,016,541	Apr. 20, 1976	Apr. 5, 1977	B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976	B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977	B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976	B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976	B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976	B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976	B 478,759	4,055,681	Mar. 16, 1976	Oct. 25, 1977
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976	B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976	B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977	B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977	B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976	B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976	B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976	B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 464,491	4,015,612	Mar. 30, 1976	Apr. 5, 1977	B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976	B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976	B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976	B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976	B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976	B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976	B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976	B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977	B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976	B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976	B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977	B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976	B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976	B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976	B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976	B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976	B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976	B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976	B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976	B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976	B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976	B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977	B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976	B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977	B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977	B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977	B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 469,228	4,052,954	Feb. 17, 1976	Oct. 11, 1977	B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976	B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976	B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976	B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977	B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976	B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976	B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976	B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976	B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977	B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976	B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977	B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977	B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977	B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976	B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976	B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976	B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976	B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976	B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 471,681	4,012,844	Apr. 13, 1976	Mar. 22, 1977	B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 471,755	3,989,408	Feb. 3, 1976	Nov. 2, 1976	B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976	B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976	B 485,972	4,017,472	Mar. 23, 1976	Apr. 12, 1977
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976	B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976	B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977	B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977	B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976	B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976	B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976	B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977
B 487,529	4,022,750	Mar. 30, 1976	May 10, 1977
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 491,711	4,053,467	Mar. 23, 1976	Oct. 11, 1977
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 494,138	4,034,002	Mar. 23, 1976	July 5, 1977
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 494,439	4,057,521	Apr. 13, 1976	Nov. 8, 1977
B 494,440	4,056,502	Feb. 17, 1976	Nov. 1, 1977
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 495,124	4,060,968	Mar. 9, 1976	Dec. 6, 1977
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977
B 510,026	4,016,763	Apr. 13, 1976	Apr. 12, 1977
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 514,839	4,033,816	Mar. 2, 1976	July 5, 1977
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 537,990	4,057,651	Jan. 13, 1976	Nov. 8, 1977
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 559,394	4,016,094	Apr. 20, 1976	Apr. 5, 1977
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 564,255	4,015,996	Mar. 30, 1976	Apr. 5, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 570,925	4,040,802	Mar. 23, 1976	Aug. 9, 1977
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 581,564	4,036,653	Mar. 23, 1976	July 19, 1977
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976	B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976	B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976	B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 6TH DAY OF DECEMBER, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Carbone, John N.; Dominguez, George S.; and Isharani, Jayanti V. Dyestuff waste water purificati[o]n. T965,001, 12-6-77, Cl. 210-52.000.

Caunt, Anthony David. Treatment of transition metal compound as component for olefin polymerization catalyst. T965,004, 12-6-77, Cl. 526-128.000.

Crane, Grant; and Kay, Edward L., to Firestone Tire & Rubber Company, The. Steam treatment of vulcanized-scrap-rubber pyrolysis char. T965,002, 12-6-77, Cl. 252-421.000.

Dominguez, George S.: *See*—
Carbone, John N.; Dominguez, George S.; and Isharani, Jayanti V., T965,001, Cl. 210-52.000.

Elwood, James K.: *See*—
Leone, Ronald E.; and Elwood, James K., T965,005, Cl. 542-429.000.

Firestone Tire & Rubber Company, The: *See*—
Crane, Grant; and Kay, Edward L., T965,002, Cl. 252-421.000.

Isharani, Jayanti V.: *See*—
Carbone, John N.; Dominguez, George S.; and Isharani, Jayanti V., T965,001, Cl. 210-52.000.

Kay, Edward L.: *See*—
Crane, Grant; and Kay, Edward L., T965,002, Cl. 252-421.000.

Leone, Ronald E.; and Elwood, James K. Nucleating agents, radiation-sensitive compositions and photographic elements. T965,005, 12-6-77, Cl. 542-429.000.

Schellekens, Joannes C. A.; and Van Beem, Eric J., to Shell Oil Company. Process for coating a pipe. T965,003, 12-6-77, Cl. 427-409.000.

Shell Oil Company: *See*—
Schellekens, Joannes C. A.; and Van Beem, Eric J., T965,003, Cl. 427-409.000.

Van Beem, Eric J.: *See*—
Schellekens, Joannes C. A.; and Van Beem, Eric J., T965,003, Cl. 427-409.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF DECEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Cabot Corporation: *See*—
Gardner, Ross, Jr., Re. 29,487, Cl. 128-152.000.

Clinton Watch Company: *See*—
Wein, Irving L., Re. 29,486, Cl. 58-91.000.

Ethyl Corporation: *See*—
Gautreaux, Marcelian F., Re. 29,488, Cl. 44-68.000.

Gardner, Ross, Jr., to Cabot Corporation. Earplugs. Re. 29,487, Cl. 128-152.000.

Gautreaux, Marcelian F., to Ethyl Corporation. Fuel compositions and additive mixtures for alleviation of exhaust gas catalyst plugging. Re. 29,488, Cl. 44-68.000.

Imperial Chemical Industries Limited: *See*—
Newton, Alan Branford; Rose, John Brewster; and Leslie, Victor Jeffrey, Re. 29,489, Cl. 260-607.0AR.

Leslie, Victor Jeffrey: *See*—
Newton, Alan Branford; Rose, John Brewster; and Leslie, Victor Jeffrey, Re. 29,489, Cl. 260-607.0AR.

Newton, Alan Branford; Rose, John Brewster; and Leslie, Victor Jeffrey, to Imperial Chemical Industries Limited. Biphenyl sulphones. Re. 29,489, Cl. 260-607.0AR.

Rose, John Brewster: *See*—
Newton, Alan Branford; Rose, John Brewster; and Leslie, Victor Jeffrey, Re. 29,489, Cl. 260-607.0AR.

Shamma, Ramzi A. System for electronic modification of sound. Re. 29,490, Cl. 179-1.0VL.

Wein, Irving L., to Clinton Watch Company. Timepiece. Re. 29,486, Cl. 58-91.000.

LIST OF PLANT PATENTEES

Grunwald, Walter, to Pan-American Plant Company. Chrysanthemum named Bronze Dolly. 4,162, 12-6-77, Cl. 79.000.

Pan-American Plant Company: *See*—
Grunwald, Walter, 4,162, Cl. 79.000.

Thoro, Andrew. Orange tree. 4,161, 12-6-77, Cl. 45.000.

LIST OF DESIGN PATENTEES

Ball Corporation: *See*—
Stahel, Alvin J., 246,561, Cl. D7-76.000.

Ballenger, William. High chair. 246,553, 12-6-77, Cl. D6-8.000.

Barr, Josef J. Diamond ring. 246,579, 12-6-77, Cl. D11-34.000.

Bateman, Robert F.: *See*—
Beauchamp, Roger P.; and Bateman, Robert F., 246,560, Cl. D7-76.000.

Baughman, Daniel G. Belt buckle or similar article. 246,552, 12-6-77, Cl. D2-406.000.

Beauchamp, Roger P.; and Bateman, Robert F. Closured and divided storage box or the like. 246,560, 12-6-77, Cl. D7-76.000.

Bell Telephone Laboratories, Incorporated: *See—*
Bhat, Ghanshyam Ambaram; Genaro, Donald Michael; Sylvester, Gordon Elliot; Watkinson, Edwin; and Wesner, John William, Jr., 246,584, Cl. D14-57.000.

Bhat, Ghanshyam Ambaram; Genaro, Donald Michael; Sylvester, Gordon Elliot; Watkinson, Edwin; and Wesner, John William, Jr., to Bell Telephone Laboratories, Incorporated. Telephone stand. 246,584, 12-6-77, Cl. D14-57.000.

Bonny Products, Inc.: *See—*
Steiner, Fred S.; and Cousins, Morison S., 246,559, Cl. D7-47.000.

Brandt, Michael W. Blade holder tool for cutting a pour spout. 246,568, 12-6-77, Cl. D8-40.000.

Bricker, Melvin D. Multi-purpose tool. 246,567, 12-6-77, Cl. D8-26.000.

Buckingham Graphics, Inc.: *See—*
Ferrarell, Michael J., 246,588, Cl. D16-33.000.

Cameron, Russell J.: *See—*
Fialkowski, Daniel H.; and Cameron, Russell J., 246,596, Cl. D23-19.000.

Caterpillar Tractor Co.: *See—*
Downing, Benjamin A., 246,615, Cl. D87-1.00R.

Christiansen, Walter N., to Gardner-Denver Company. Hand-held tool for removing insulation from electrical conductors. 246,570, 12-6-77, Cl. D8-98.000.

Cognata, Larry M. Belt guard for a roto-tiller. 246,586, 12-6-77, Cl. D15-12.000.

Cousins, Michael A.: *See—*
Cousins, Morison S.; and Cousins, Michael A., 246,605, Cl. D28-13.000.
Cousins, Morison S.; Cousins, Michael A.; and Rhodes, Greydon A., III, 246,606, Cl. D28-18.000.

Cousins, Morison S.; and Cousins, Michael A., to Gillette Company, The. Portable hair dryer. 246,605, 12-6-77, Cl. D28-13.000.

Cousins, Morison S.; Cousins, Michael A.; and Rhodes, Greydon A., III, to Gillette Company, The. Styler handle. 246,606, 12-6-77, Cl. D28-18.000.

Cousins, Morison S.: *See—*
Steiner, Fred S.; and Cousins, Morison S., 246,559, Cl. D7-47.000.

Dallaire, Raymond. Window component extrusion. 246,601, 12-6-77, Cl. D25-74.000.

Dansk International Designs Ltd.: *See—*
Hube, Vivanna Torun Bulow, 246,563, Cl. D7-150.000.

DeLuca, Paul V. Telephone connector block guide. 246,581, 12-6-77, Cl. D13-13.000.

Doerner, Frank. Chair control. 246,558, 12-6-77, Cl. D6-191.000.

Downing, Benjamin A., to Caterpillar Tractor Co. Combined storage and shipping container. 246,615, 12-6-77, Cl. D87-1.00R.

Epoch Company, Ltd.: *See—*
Matsumoto, Teruo, 246,610, Cl. D34-5.0SS.

Ferrarell, Michael J., to Buckingham Graphics, Inc. Film dryer. 246,588, 12-6-77, Cl. D16-33.000.

Fialkowski, Daniel H.; and Cameron, Russell J., to Ross Operating Valve Company. Cover for solenoid operated pilot valve. 246,596, 12-6-77, Cl. D23-19.000.

Fisher, Morris F., to Futorian Corporation. Chair. 246,554, 12-6-77, Cl. D6-71.000.

Frost, Charles W. Cigarette holder. 246,602, 12-6-77, Cl. D27-2.000.

Frost, Charles W. Smoking pipe. 246,603, 12-6-77, Cl. D27-3.000.

Frost, Charles W. Smoking pipe. 246,604, 12-6-77, Cl. D27-3.000.

Futorian Corporation: *See—*
Fisher, Morris F., 246,554, Cl. D6-71.000.

Gardner-Denver Company: *See—*
Christiansen, Walter N., 246,570, Cl. D8-98.000.

Genaro, Donald Michael: *See—*
Bhat, Ghanshyam Ambaram; Genaro, Donald Michael; Sylvester, Gordon Elliot; Watkinson, Edwin; and Wesner, John William, Jr., 246,584, Cl. D14-57.000.

General Electric Company: *See—*
Grieb, Joan, 246,571, Cl. D8-350.000.
Okada, Tomoji, 246,582, Cl. D14-6.000.
Okada, Tomoji, 246,583, Cl. D14-6.000.

Gillette Company, The: *See—*
Cousins, Morison S.; and Cousins, Michael A., 246,605, Cl. D28-13.000.
Cousins, Morison S.; Cousins, Michael A.; and Rhodes, Greydon A., III, 246,606, Cl. D28-18.000.

Gilmartin, Michael D.; and Ginella, James A. Holder for seed packets or the like. 246,557, 12-6-77, Cl. D6-130.000.

Ginella, James A.: *See—*
Gilmartin, Michael D.; and Ginella, James A., 246,557, Cl. D6-130.000.

Gordon, David L.: *See—*
Johnson, Ray W., 246,614, Cl. D34-15.0BB.

Grieb, Joan, to General Electric Company. Wall plate. 246,571, 12-6-77, Cl. D8-350.000.

Hansjosten, Nikolaus; and Langwara, Christoph, to Industriewerke Lemm & Co. GmbH. Shoe sole. 246,551, 12-6-77, Cl. D2-320.000.

Haufe, David K., to Sunbeam Corporation. Blender base. 246,564, 12-6-77, Cl. D7-154.000.

Hefendehl, Hans Friedrich: *See—*
Zeischegg, Walter, 246,592, Cl. D19-75.000.

Holtje, Wilfried; and Prochnow, Claus, to Rollei-Werke Franke & Heidecke. Electronic flash unit. 246,589, 12-6-77, Cl. D16-42.000.

Hosick, Frank A., to K-2 Corporation. Ski pole grip or similar article. 246,612, 12-6-77, Cl. D34-14.00D.

Hube, Vivanna Torun Bulow, to Dansk International Designs Ltd. Knife or a similar article. 246,563, 12-6-77, Cl. D7-150.000.

Inaba, Kanji, to Kabushiki Kaisha Daini Seikosha. Watch case. 246,576, 12-6-77, Cl. D10-30.000.

Inaba, Kanji, to Kabushiki Kaisha Daini Seikosha, JA. Watch case. 246,577, 12-6-77, Cl. D10-30.000.

Industriewerke Lemm & Co. GmbH: *See—*
Hansjosten, Nikolaus; and Langwara, Christoph, 246,551, Cl. D2-320.000.

Ishida, Satoshi: *See—*
Onodera, Tsuyoshi; and Ishida, Satoshi, 246,575, Cl. D10-30.000.

Japan Medical Supply Co., Ltd.: *See—*
Kurata, Motoji, 246,600, Cl. D24-56.000.

Johnson, Ray W., to Gordon, David L., a part interest. Simulative toy top. 246,614, 12-6-77, Cl. D34-15.0BB.

K-2 Corporation: *See—*
Hosick, Frank A., 246,612, Cl. D34-14.00D.

Kabushiki Kaisha Daini Seikosha: *See—*
Inaba, Kanji, 246,576, Cl. D10-30.000.
Inaba, Kanji, 246,577, Cl. D10-30.000.
Onodera, Tsuyoshi; and Ishida, Satoshi, 246,575, Cl. D10-30.000.

Kanno, Hideyuki, to Tomy Kogyo Co., Inc. Game board. 246,609, 12-6-77, Cl. D34-5.0SS.

Kurata, Motoji, to Japan Medical Supply Co., Ltd. Test tube. 246,600, 12-6-77, Cl. D24-56.000.

Langwara, Christoph: *See—*
Hansjosten, Nikolaus; and Langwara, Christoph, 246,551, Cl. D2-320.000.

Laylon, Harry. Side chair. 246,555, 12-6-77, Cl. D6-75.000.

Loma Corporation: *See—*
Van Skiver, Ralph, 246,566, Cl. D7-194.000.

M & M Luggage Co., Inc.: *See—*
Sollazzi, Pasquale R., 246,590, Cl. D19-13.000.
Sollazzi, Pasquale R., 246,591, Cl. D19-13.000.

Matsumoto, Teruo, to Epoch Company, Ltd. Electrical circuit game board. 246,610, 12-6-77, Cl. D34-5.0SS.

Max, Lester S.: *See—*
Miller, Samuel A., 246,587, Cl. D15-56.000.

Meierhoefer, Eugene J., to Warner-Lambert Company. Bottle or similar article. 246,574, 12-6-77, Cl. D9-67.000.

Miller, C. March: *See—*
Noyes, Henry C., Jr.; and Miller, C. March, 246,611, Cl. D34-5.0PP.

Miller, Samuel A., to Newman, Ruth Max; and Max, Lester S. Head for a surface-treating machine. 246,587, 12-6-77, Cl. D15-56.000.

Morrison, Paul Merlin. Mercury removing device for dental amalgamators. 246,598, 12-6-77, Cl. D24-1.100.

Nagasaka, Yoshizo, to Tomy Kogyo Co., Inc. Doll. 246,608, 12-6-77, Cl. D34-4.00R.

Newman, Ruth Max: *See—*
Miller, Samuel A., 246,587, Cl. D15-56.000.

Noyes, Henry C., Jr.; and Miller, C. March. Game target. 246,611, 12-6-77, Cl. D34-5.0PP.

Ogawa, Iwakichi, to Takara Co., Ltd. Toy racing car. 246,613, 12-6-77, Cl. D34-15.0AJ.

Okada, Tomoji, to General Electric Company. Cassette tape recorder. 246,582, 12-6-77, Cl. D14-6.000.

Okada, Tomoji, to General Electric Company. Cassette tape recorder. 246,583, 12-6-77, Cl. D14-6.000.

Onodera, Tsuyoshi; and Ishida, Satoshi, to Kabushiki Kaisha Daini Seikosha. Watch case. 246,575, 12-6-77, Cl. D10-30.000.

Paquette, Edmund T., to Wright Line Inc. Desk top hanger for suspension-type document holders. 246,593, 12-6-77, Cl. D19-90.000.

Parduhn, Alfred P. Antenna mounting bracket. 246,585, 12-6-77, Cl. 14-91.000.

Parsons, Randolph C. Bed. 246,556, 12-6-77, Cl. D6-79.000.

Penniman, Allen D., Jr.: *See—*
Ward, Michael V.; Penniman, Allen D., Jr.; and Pikul, Richard E., 246,599, Cl. D24-17.000.

Pikul, Richard E.: *See—*
Ward, Michael V.; Penniman, Allen D., Jr.; and Pikul, Richard E., 246,599, Cl. D24-17.000.

Prochnow, Claus: *See—*
Holtje, Wilfried; and Prochnow, Claus, 246,589, Cl. D16-42.000.

Puritan-Bennett Corporation: *See—*
Ward, Michael V.; Penniman, Allen D., Jr.; and Pikul, Richard E., 246,599, Cl. D24-17.000.

Radisich, Michael R. Pendant or the like. 246,607, 12-6-77, Cl. D31-21.300.

Rasmussen, Richard A. Trophy base. 246,580, 12-6-77, Cl. D11-157.000.

Rhodes, Greydon A., III: *See—*
Cousins, Morison S.; Cousins, Michael A.; and Rhodes, Greydon A., III, 246,606, Cl. D28-18.000.

Rice, Richard E., to University of California, The Regents of the. Insect trap. 246,594, 12-6-77, Cl. D22-19.000.

Ridgeway, Louis H. Bathtub. 246,597, 12-6-77, Cl. D23-55.000.

Roark, Harry B. Support stand for flexible bags. 246,565, 12-6-77, Cl. D7-189.000.

Rollei-Werke Franke & Heidecke: *See—*
Holtje, Wilfried; and Prochnow, Claus, 246,589, Cl. D16-42.000.

Ross Operating Valve Company: *See—*
Fialkowski, Daniel H.; and Cameron, Russell J., 246,596, Cl. D23-19.000.

Sollazzi, Pasquale R., to M & M Luggage Co., Inc. Combined luggage handle loop and concealed identification tag or similar article. 246,590, 12-6-77, Cl. D19-13.000.

Sollazzi, Pasquale R., to M & M Luggage Co., Inc. Combined luggage

flap and concealed identification tag or similar article. 246,591, 12-6-77, Cl. D19-13.000.
Stahel, Alvin J., to Ball Corporation. Covered storage container. 246,561, 12-6-77, Cl. D7-76.000.
Steiner, Fred S.; and Cousins, Morison S., to Bonny Products, Inc. Stackable colander. 246,559, 12-6-77, Cl. D7-47.000.
Stoddard, Ione M. Combined ice chest and wine cooler. 246,562, 12-6-77, Cl. D7-78.000.
Sunbeam Corporation: *See*—
Haufe, David K., 246,564, Cl. D7-154.000.
Sylvester, Gordon Elliot: *See*—
Bhat, Ghanshyam Ambaram; Genaro, Donald Michael; Sylvester, Gordon Elliot; Watkinson, Edwin; and Wesner, John William, Jr., 246,584, Cl. D14-57.000.
Takara Co., Ltd.: *See*—
Ogawa, Iwakichi, 246,613, Cl. D34-15.0AJ.
Tomy Kogyo Co., Inc.: *See*—
Kanno, Hideyuki, 246,609, Cl. D34-5.0SS.
Nagasaka, Yoshizo, 246,608, Cl. D34-4.00R.
University of California, The Regents of the: *See*—
Rice, Richard E., 246,594, Cl. D22-19.000.
Van Skiver, Ralph, to Loma Corporation. Lid for refuse container. 246,566, 12-6-77, Cl. D7-194.000.
Walter, Le Roy A. Stand for holding a vehicle air conditioner compressor at different angles during repair. 246,572, 12-6-77, Cl. D8-354.000.
Ward, Michael V.; Penniman, Allen D., Jr.; and Pikul, Richard E., to Puritan-Bennett Corporation. Pulmonary diagnostic instrument unit. 246,599, 12-6-77, Cl. D24-17.000.
Warner-Lambert Company: *See*—
Meierhoefer, Eugene J., 246,574, Cl. D9-67.000.
Watkinson, Edwin: *See*—
Bhat, Ghanshyam Ambaram; Genaro, Donald Michael; Sylvester, Gordon Elliot; Watkinson, Edwin; and Wesner, John William, Jr., 246,584, Cl. D14-57.000.
Wesner, John William, Jr.: *See*—
Bhat, Ghanshyam Ambaram; Genaro, Donald Michael; Sylvester, Gordon Elliot; Watkinson, Edwin; and Wesner, John William, Jr., 246,584, Cl. D14-57.000.
Wesson, Albert G. Cement finishing tool. 246,569, 12-6-77, Cl. D8-45.000.
White, Donald A. Fire alarm. 246,578, 12-6-77, Cl. D10-106.000.
White, Donald E. Base bracket for supporting a brick veneer wall from a house foundation wall. 246,573, 12-6-77, Cl. D8-384.000.
Williams, William O., Jr. Artificial fishing lure. 246,595, 12-6-77, Cl. D22-27.000.
Wright Line Inc.: *See*—
Paquette, Edmund T., 246,593, Cl. D19-90.000.
Zeischegg, Walter, to Hefendehl, Hans Friedrich. Desk set. 246,592, 12-6-77, Cl. D19-75.000.

84
108
338
413

1.3

26
57 F
102
172.1
253

260
337

79
185

6 M

310 D
313

72 R

115.2

24
31

24
29
250.0
256.5
405

1 F

230 B
232 R
253 R
253 T
258.5
260

3 J
33 B
230 A

132
156.8
256
407
410
626
628

90.1
253
310
382
384

10 A
11
40 R

75 R
108
114
125 R
172 R
180 R

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 6, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

84	4,060,852
108	4,060,853
338	4,060,854
413	4,060,855

CLASS 3

1.3	4,060,856

CLASS 4

26	4,060,857
57 R	4,060,858
102	4,060,859
172.14	4,060,860
253	4,060,861

CLASS 5

260	4,060,862
337	4,060,863

CLASS 8

79	4,061,464
185	4,061,465

CLASS 9

6 M	4,060,864
	4,060,865
310 D	4,060,866
313	4,060,867

CLASS 10

72 R	4,060,868

CLASS 12

115.2	4,060,869

CLASS 13

24	4,061,870
31	4,061,871

CLASS 15

24	4,060,870
29	4,060,871
250.04	4,060,872
256.5	4,060,873
405	4,060,874

CLASS 17

1 F	4,060,875

CLASS 23

230 B	4,061,466
232 R	4,061,467
253 R	4,061,469
253 TP	4,061,468
258.5 M	4,061,470
260	4,061,471

CLASS 24

3 J	4,060,876
33 B	4,060,877
230 A	4,060,878
	4,060,879

CLASS 29

132	4,060,882
156.8 R	4,060,883
256	4,060,884
407	4,060,885
410	4,060,886
626	4,060,887
628	4,060,888
	4,060,889
	4,060,890

CLASS 30

90.1	4,060,891
253	4,060,892
310	4,060,893
382	4,060,894
384	4,060,895

CLASS 32

10 A	4,060,896
11	4,060,899
40 R	4,060,897
	4,060,898

CLASS 33

75 R	4,060,900
108	4,060,901
114	4,060,902
125 R	4,060,903
172 R	4,060,904
180 R	4,060,905
181 R	4,060,906
184.5	4,060,907
275 R	4,060,908
296	4,060,909
324	4,060,910

CLASS 34

5	4,060,911
9	4,060,912
80	4,060,913
219	4,060,914

CLASS 35

9 A	4,060,915
10	4,060,916

CLASS 36

59 C	4,060,917
97	4,060,918

CLASS 40

104 A	4,060,919
140	4,060,920
301	4,060,921
302	4,060,922

CLASS 43

4	4,060,923
24	4,060,924
41.2	4,060,925
42.44	4,060,926
43.1	4,060,927
43.16	4,060,928

CLASS 44

1 R	4,061,472
51	4,061,473
66	4,061,474
68	Re.29,488

CLASS 46

11	4,060,929
81	4,060,930
112	4,060,931
116	4,060,932

CLASS 47

58	4,060,933
79	4,060,934

CLASS 48

197 R	4,061,475

CLASS 49

25	4,060,935
465	4,060,936

CLASS 51

80 A	4,060,937
110	4,060,938
157	4,060,939
170 PT	4,060,940
211 H	4,060,941
268	4,060,942
281 R	4,060,943

CLASS 52

43	4,060,944
169.5	4,060,945
169.7	4,060,946
179	4,060,947
236.8	4,060,948
285	4,060,949
455	4,060,950
508	4,060,951
593	4,060,952
677	4,060,954
743	4,060,953
749	4,060,955

CLASS 53

22 R	4,060,956
26	4,060,957
37	4,060,958
373	4,060,959

CLASS 55

77	4,061,476
79	4,061,477
257 C	4,061,479
257 PV	4,061,478
356	4,061,480

CLASS 56

14.6	4,060,960
294	4,060,961
336	4,060,962

CLASS 57

1 R	4,060,963
34 HS	4,060,964
34 R	4,060,965
58.89	4,060,966
77.45	4,060,967
102	4,060,969
140 BY	4,060,968
140 R	4,060,970

CLASS 58

4 A	4,060,971
16 D	4,060,972
19 R	4,060,973
23 R	4,060,974
50 R	4,060,975
58	4,060,976
85.5	4,060,977
91	Re.29,486

CLASS 59

78	4,060,978

CLASS 60

39.03	4,060,979
	4,060,980
226 R	4,060,981
282	4,060,982
	4,060,983
290	4,060,984
319	4,060,985
388	4,060,986
409	4,060,987
641	4,060,988
650	4,060,989
676	4,060,990

CLASS 61

13	4,060,991
41 A	4,060,992
43	4,060,993
53.6	4,060,994
92	4,060,995

CLASS 62

6	4,060,996
29	4,061,481
155	4,061,482
180	4,060,997
268	4,061,483
320	4,060,998

CLASS 65

2	4,061,484
4 R	4,061,485
18	4,061,486
135	4,061,487

CLASS 66

125 A	4,060,999

CLASS 68

23.7	4,061,000
200	4,061,001
212	4,061,002

CLASS 70

352	4,061,003
363	4,061,004

CLASS 71

68	4,061,490
77	4,061,488
88	4,061,489
92	4,061,491

CLASS 72

30	4,061,005
34	4,061,006
56	4,061,007
69	4,061,009
98	4,061,008
201	4,061,010
262	4,061,011
347	4,061,012
354	4,061,013

CLASS 73

45.1	4,061,014
49.5	4,061,015
60.1	4,061,016
81	4,061,020
84	4,061,021
95	4,061,022
114	4,061,023
	4,061,024
116	4,061,025
	4,061,026
119 A	4,061,027
179	4,061,028
180	4,061,029
194 E	4,061,030
200	4,061,031
273	4,061,032
339 R	4,061,033
398 AR	4,061,034
406	4,061,035
421.5 A	4,061,036
425.6	4,061,037
427	4,061,038
489	4,061,039
505	4,061,040
579	4,061,017
629	4,061,018
646	4,061,041
647	4,061,042
662	4,061,019

CLASS 74

5.6 D	4,061,043
31	4,061,044
198	4,061,045
217 B	4,061,046
230.17 C	4,061,047
242	4,061,048
424.8 R	4,061,049
469	4,061,050
474	4,061,051
498	4,061,052
512	4,061,053
552	4,061,054
866	4,061,055

CLASS 75

10 C	4,061,493
10 R	4,061,492
124	4,061,494
134 F	4,061,495

CLASS 76

104 R	4,061,056
112	4,061,057

CLASS 81

90 C	4,061,058

CLASS 82

1 C	4,061,059
2.5	4,061,061
2.7	4,061,062
3	4,061,060

CLASS 83

55	4,061,063
368	4,061,064
404.4	4,061,070
562	4,061,065
808	4,061,066

CLASS 84

236	4,061,067
275	4,061,068
315	4,061,069
455	4,061,071
478	4,061,072

CLASS 85

62	4,061,073

CLASS 89

33 CA	4,061,074
132	4,061,075

CLASS 90

11 A	4,061,076
15 A	4,061,077
24 C	4,061,078

CLASS 91

372	4,061,079

CLASS 92

13.2	4,061,080

CLASS 93

53 SD	4,061,081

CLASS 96

29 D	4,061,496
77	4,061,497
100 R	4,061,498
111	4,061,499

CLASS 98

40 D	4,061,082

CLASS 99

345	4,061,083

CLASS 100

1	4,061,084

CLASS 101

150	4,061,085
240	4,061,086
415.1	4,061,087

CLASS 102

28 R	4,061,088

CLASS 104

23 FS	4,061,089

CLASS 106

15 R	4,061,500
44	4,061,501
72	4,061,502
300	4,061,503

CLASS 108

51.1	4,061,090
84	4,061,091
149	4,061,092

CLASS 109

19	4,061,093

CLASS 111

89	4,061,094

CLASS 112

79 R	4,061,095
121.14	4,061,096
121.15	4,061,097

CLASS 113

116 Q	4,061,098

CLASS 114

39	4,061,099
43	4,061,100
106	4,061,101
122	4,061,102
252	4,061,103
281	4,061,104

CLASS 115

3	4,061,105
24.1	4,061,106

CLASS 116

67 R	4,061,107

CLASS 118

100	4,061,108
118	4,061,109

CLASS 119

4	4,061,110
159	4,061,111

CLASS 122

7 R	4,061,112

CLASS 123

26	4,061,113
32 SJ	4,061,114
90.16	4,061,115
117 D	4,061,116
119 A	4,061,119
119 EC	4,061,117
119 LR	4,061,118
143 A	4,061,120
149 R	4,061,121
169 R	4,061,122
198 F	4,061,123

CLASS 124

23 R	4,061,124
24 R	4,061,125

CLASS 125

21	4,061,126

CLASS 126

120	4,061,127
210	4,061,128
270	4,061,129
271	4,061,130
	4,061,131
	4,061,132
350 R	4,061,133

CLASS 128

1 R	4,061,134
6	4,061,135
24.1	4,061,136
33	4,061,137
82	4,061,138
145 A	4,061,140
152	Re.29,487
214 R	4,061,141
	4,061,142
218 N	4,061,143
227	4,061,144
275	4,061,145
305	4,061,146

CLASS 131

4 A	4,061,147
23 R	4,061,148
231	4,061,149

CLASS 132

7	4,061,150

CLASS 134

33	4,061,151
73	4,061,152
95	4,061,504
138	4,061,153

CLASS 135

34	4,061,154

CLASS 136

238	4,061,505

CLASS 137

85	4,061,155
109	4,061,156
242	4,061,157
552.5	4,061,158
596	4,061,159
637.2	4,061,160

CLASS 138

30	4,061,161
147	4,061,162

CLASS 141

7	4,061,163
90	4,061,164

CLASS 144

1 R	4,061,165
2 Z	4,061,166
34 E	4,061,167
193 R	4,061,168
213	4,061,169

CLASS 148

1.5	4,061,506
12 R	4,061,507
31.55	4,061,509
128	4,061,508
187	4,061,510

CLASS 149

19.9	4,061,511
22	4,061,512

CLASS 150

52 R	4,061,170

CLASS 152

352 R	4,061,171
379.1	4,061,172

CLASS 156

63	4,061,514
73.6	4,061,515
94	4,061,516
212	4,061,517
232	4,061,518

244 4,061,519
245 4,061,520
265 4,061,521
305 4,061,522
380 4,061,523
392 4,061,513
397 4,061,524
460 4,061,525
468 4,061,526
519 4,061,527
561 4,061,528
644 4,061,529
653 4,061,530

CLASS 157

1.17 4,061,173

CLASS 159

48 L 4,061,531

CLASS 162

19 4,061,193
352 4,061,532

CLASS 164

6 4,061,174
45 4,061,175
61 4,061,176
87 4,061,177
4,061,178
151 4,061,179
252 4,061,180
292 4,061,181
309 4,061,182

CLASS 165

8 4,061,183
38 4,061,184
48 4,061,185
59 4,061,186
107 4,061,187
122 4,061,188
168 4,061,189

CLASS 166

259 4,061,190
292 4,061,191

CLASS 169

16 4,061,192

CLASS 172

447 4,061,194
456 4,061,195

CLASS 173

49 4,061,196

CLASS 174

138 F 4,061,872
208 4,061,873

CLASS 175

101 4,061,197

CLASS 176

20 R 4,061,533
37 4,061,534
38 4,061,535
78 4,061,536

CLASS 177

50 4,061,198

CLASS 179

1 AT 4,061,876
1 E 4,061,877
1 P 4,061,874
4,061,875
1 SC 4,061,878
1 VL Re.29,490
15 BA 4,061,879
4,061,880
15 BF 4,061,881
15 BT 4,061,882
16 F 4,061,883
18 GF 4,061,884
84 VF 4,061,885
4,061,886
99 4,061,887
100 D 4,061,888
100.3 T 4,061,889
115.5 VC 4,061,890
175.1 A 4,061,891
175.3 R 4,061,892

CLASS 180

8 A 4,061,199
66 B 4,061,200
133 4,061,201

CLASS 182

20 4,061,202
214 4,061,203

CLASS 184

6.3 4,061,204

CLASS 186

1 A 4,061,205

CLASS 188

26 4,061,206
71.9 4,061,208
73.3 4,061,209
79.5 P 4,061,210
4,061,211
181 A 4,061,212
181 R 4,061,213
206 A 4,061,429
264 E 4,061,207
277 4,061,214

CLASS 192

4 A 4,061,215
46 4,061,216
58 B 4,061,218
052 4,061,217

CLASS 195

1.7 4,061,537
29 4,061,538
31 F 4,061,539
62 4,061,540
66 R 4,061,541
80 R 4,061,542
103.5 K 4,061,543

CLASS 197

164 4,061,219
181 4,061,220

CLASS 198

524 4,061,221
807 4,061,222
821 4,061,223

CLASS 200

38 D 4,061,893
144 B 4,061,894
157 4,061,895
323 4,061,896

CLASS 202

141 4,061,544

CLASS 203

9 4,061,545
31 4,061,546

CLASS 204

54 R 4,061,547
78 4,061,548
98 4,061,549
4,061,550
105 R 4,061,551
106 4,061,559
107 4,061,552
114 4,061,553
129 4,061,554
242 4,061,555
271 4,061,556
277 4,061,557
290 F 4,061,558
299 R 4,061,560
4,061,561

CLASS 206

1.7 4,061,224
230 4,061,225
306 4,061,226
454 4,061,227
4,061,228
486 4,061,229

CLASS 208

61 4,061,562
111 4,061,563

CLASS 210

21 4,061,564
32 4,061,565
4,061,566
40 4,061,567
44 4,061,568
83 4,061,569
96 M 4,061,570
130 4,061,571
168 4,061,572
282 4,061,573
321 R 4,061,574
350 4,061,575
437 4,061,576

CLASS 212

70 4,061,230

CLASS 214

1 BB 4,061,232
1 P 4,061,231
2.5 4,061,233
6 M 4,061,234
64 4,061,235
309 4,061,236
515 4,061,237
750 4,061,238

CLASS 215

221 4,061,239
270 4,061,240

CLASS 219

131 R 4,061,899
211 4,061,897
4,061,898

CLASS 220

4 B 4,061,241
90 4,061,242
269 4,061,243
310 4,061,244

CLASS 221

75 4,061,245

CLASS 222

1 4,061,246
4,061,247
4 4,061,248
78 4,061,249
321 4,061,250
402.18 4,061,252
402.2 4,061,251
442 4,061,253
494 4,061,254
566 4,061,255

CLASS 224

5 D 4,061,256
42.08 4,061,257
42.42 R 4,061,258
51 4,061,259

CLASS 226

139 4,061,260

CLASS 228

2.5 4,061,261
50 4,061,262
107 4,061,139
124 4,061,263
145 4,061,264

CLASS 235

92 EV 4,061,901
197 4,061,909
302.3 4,061,908
437 4,061,900

CLASS 236

48 R 4,061,265
49 4,061,266

CLASS 237

1 A 4,061,267

CLASS 238

14 4,061,268
17 4,061,269
107 4,061,270

CLASS 239

1 4,061,271
145 4,061,272
172 4,061,273

CLASS 241

24 4,061,274
46.04 4,061,275
69 4,061,276
73 4,061,277
74 4,061,278
86.1 4,061,279
101.6 4,061,280
188 R 4,061,281
222 4,061,282
261.3 4,061,283
294 4,061,284

CLASS 242

7.13 4,061,289
18 R 4,061,285
56 R 4,061,286
67.1 R 4,061,287
84.1 K 4,061,288
96 4,061,290
107 4,061,291
201 4,061,292

CLASS 244

26 4,061,293
103 S 4,061,294
104 FP 4,061,295
112 4,061,296
184 4,061,297

CLASS 248

23 4,061,298
73 4,061,299
125 4,061,300
156 4,061,301
170 4,061,302
204 4,061,303
404 4,061,304
432 4,061,305
523 4,061,306

CLASS 250

199 4,061,577
201 4,061,914
315 A 4,061,915
330 4,061,578
332 4,061,916
338 4,061,917
343 4,061,918
363 S 4,061,919
413 4,061,920
423 P 4,061,921
461 R 4,061,922
468 4,061,923
476 4,061,924
553 4,061,925

CLASS 251

315 4,061,307

CLASS 252

8.1 4,061,579
8.55 R 4,061,580
32.7 E 4,061,581
62.1 L 4,061,582
62.3 BT 4,061,583
63 4,061,584
89 R 4,061,585
153 4,061,586
299 4,061,587
389 A 4,061,589
426 4,061,590
429 R 4,061,588
430 4,061,591
439 4,061,592
443 4,061,593
462 4,061,594
463 4,061,595
4,061,596
465 4,061,597
466 PT 4,061,598
501 4,061,599
510 4,061,600
511 4,061,601
547 4,061,602
548 4,061,603

CLASS 254

10.5 4,061,308
86 H 4,061,309
93 HP 4,061,310
168 4,061,311

CLASS 256

10 4,061,312

CLASS 260

2.5 AJ 4,061,604
4,061,605
2.5 R 4,061,606
8 4,061,607
4,061,608
9 4,061,609
17.4 ST 4,061,610
4,061,611
29.2 N 4,061,619
29.2 TN 4,061,618
29.3 4,061,620
31.4 R 4,061,612
40 R 4,061,613
4,061,614
45.7 P 4,061,615
45.8 N 4,061,616
47 R 4,061,617
78 L 4,061,621
78 R 4,061,622
78 TF 4,061,623
79.3 M 4,061,624
112.5 R 4,061,625
112.5 S 4,061,626
178 4,061,627
239.1 4,061,628
4,061,629
250 P 4,061,636
268 PH 4,061,637
270 P 4,061,638
283 S 4,061,639
287 CE 4,061,640
293.61 4,061,641
295 R 4,061,643
295.5 A 4,061,642
296 R 4,061,644
302 SD 4,061,645
306 4,061,646
306.7 T 4,061,647
306.8 D 4,061,648
307 F 4,061,650
307 FA 4,061,649
307 H 4,061,651
308 B 4,061,652
314.5 4,061,654
315 4,061,655
332.2 A 4,061,656
343.3 P 4,061,657
346.11 4,061,658
348.34 4,061,659
396 R 4,061,660
397.45 4,061,661
410.9 R 4,061,665
456 A 4,061,663
465 D 4,061,664
500.5 H 4,061,668
505 N 4,061,669
514 D 4,061,670
4,061,671
4,061,672
526 N 4,061,673
534 S 4,061,674
555 A 4,061,675
559 AT 4,061,676
566 A 4,061,677
570 D 4,061,678
586 F 4,061,679
606 4,061,680
606.5 P 4,061,681
607 AR Re.29,489
611 A 4,061,682
613 R 4,061,683
615 B 4,061,684
621 G 4,061,685
631 R 4,061,686
632 HF 4,061,687
651 F 4,061,688
671 R 4,061,689
676 R 4,061,690
860 4,061,691
874 4,061,692
876 R 4,061,693
878 B 4,061,694
929 4,061,695
930 4,061,696
944 4,061,697

CLASS 261

78 A 4,061,698

CLASS 264

0.5 4,061,700
5 4,061,699
24 4,061,702
36 4,061,703
51 4,061,701
83 4,061,704
89 4,061,705
90 4,061,706
95 4,061,707
211 4,061,708
293 4,061,709
300 4,061,710

CLASS 266

193 4,061,317
246 4,061,318
281 4,061,319

CLASS 267

64 R 4,061,320

CLASS 269

41 4,061,321
43 4,061,322
139 4,061,323
325 4,061,324

CLASS 270

40 4,061,325
69 4,061,326
78 4,061,327

CLASS 271

10 4,061,328
4,061,329
174 4,061,330
223 4,061,331
270 4,061,332

CLASS 273

73 E 4,061,333
126 A 4,061,334
134 AC 4,061,336
134 AT 4,061,335
4,061,337
138 R 4,061,338
157 R 4,061,339
189 R 4,061,340

CLASS 274

1 R 4,061,341
23 A 4,061,342
24 R 4,061,343

CLASS 277

26 4,061,344
88 4,061,345
205 4,061,346

CLASS 280

11.21 4,061,348
11.37 H 4,061,347
47.2 4,061,349
87.04 A 4,061,350
4,061,351
106 T 4,061,353
154.5 R 4,061,352
288 4,061,354
605 4,061,355
4,061,356
4,061,357
629 4,061,358
638 4,061,359
652 4,061,360
681 4,061,361
689 4,061,362
718 4,061,363
4,061,364
745 4,061,365

CLASS 285

37 4,061,366
382.2 4,061,367
383 4,061,368

CLASS 290

55 4,061,926

CLASS 292

163 4,061,369
175 4,061,370
198 4,061,371
207 4,061,372
251 4,061,373
260 4,061,382
335 4,061,383

CLASS 293

71 P 4,061,385
71 R 4,061,384
86 4,061,386

CLASS 294

26 4,061,387
82 R 4,061,388
86.3 4,061,389

CLASS 296

1 A 4,061,390
4 4,061,391
28 C 4,061,392
4,061,393
100 4,061,394

CLASS 297

192 4,061,395
283 4,061,396
330 4,061,397

CLASS 299

17 4,061,398
18 4,061,399

CLASS 301

37 AT 4,061,400

CLASS 302

41 4,061,401

CLASS 303

92 4,061,402
106 4,061,403
118 4,061,404

CLASS 307

41 4,061,927
200 B 4,061,928
246 4,061,929
254 4,061,930
262 4,061,933
300 4,061,931
360 4,061,932

CLASS 308

1 R 4,061,374
3.6 4,061,375
8.2 4,061,376
207 R 4,061,377

CLASS 310

41 4,061,936
65 4,061,937
68 C 4,061,935
168 4,061,938
323 4,061,934

CLASS 312

20 4,061,378
201 4,061,379

CLASS 313

25 4,061,939
318 4,061,940
414 4,061,941
417 4,061,942
420 4,061,944
481 4,061,945
482 4,061,943
488 4,061,946

CLASS 318

77 4,061,947
87 4,061,948
154 4,061,949

314 4,061,950
443 4,061,951
572 4,061,952
573 4,061,953

CLASS 320

1 4,061,954
6 4,061,955
22 4,061,956

CLASS 323

1 4,061,959
9 4,061,960
21 4,061,961
22 R 4,061,962
43.5 R 4,061,963

CLASS 324

28 SE 4,061,964
29 4,061,965
40 4,061,968
73 PC 4,061,969
207 4,061,966
260 4,061,967

CLASS 325

2 4,061,970
15 4,061,971
16 4,061,972
17 4,061,973
58 4,061,974
322 4,061,975
4,061,976
323 4,061,977
324 4,061,978
419 4,061,979
4,061,980
4,061,981
464 4,061,982

CLASS 330

149 4,061,984
207 P 4,061,983

CLASS 331

94.5 C 4,061,985
94.5 PE 4,061,986
111 4,061,987

CLASS 333

7 R 4,061,989
10 4,061,990
22 R 4,061,991
73 R 4,061,992

CLASS 335

20 4,061,993
202 4,061,994

CLASS 338

32 H 4,061,988

CLASS 339

8 P 4,061,381
8 R 4,061,380
17 M 4,061,405
47 C 4,061,406
75 P 4,061,407
4,061,409
75 R 4,061,408
95 R 4,061,413
113 B 4,061,410
159 R 4,061,411
263 R 4,061,412

CLASS 340

24 4,061,995
27 R 4,061,996
146.1 AX 4,061,997
146.3 AC 4,061,998
187 4,062,004
198 4,062,005
228 R 4,062,006
309.1 4,062,007
323 R 4,062,008
324 R 4,062,009
347 DA 4,062,013
347 DD 4,062,014

CLASS 343

5 NA 4,062,010
7 A 4,062,011
4,062,012
120 4,062,015
178 4,062,016
722 4,062,017
754 4,062,018
797 4,062,019

CLASS 346

33 R 4,062,020
136 4,062,021

CLASS 350

4 4,061,414
6 4,061,415
96 C 4,061,416
159 4,061,417
160 LC 4,061,418
184 4,061,419
199 4,061,420
214 4,061,421
293 4,061,422

CLASS 351

16 4,061,423

CLASS 354

38 4,062,022
4,062,023
60 R 4,062,024
76 4,062,025
106 4,062,026
127 4,062,027
152 4,062,028
232 4,062,029
286 4,062,030
299 4,062,031

CLASS 355

63 4,061,424

CLASS 356

110 4,061,425
138 4,061,426
159 4,061,427
175 4,061,428
227 4,061,431

CLASS 357

13 4,062,032
15 4,062,033
16 4,062,034
17 4,062,035
22 4,062,036
24 4,062,037
30 4,062,038
51 4,062,039
54 4,062,040

CLASS 359

8 4,062,041
21 4,062,044
27 4,062,042
86 4,062,043
88 4,062,045
93 4,062,046

CLASS 360

26 4,062,047
30 4,062,050
72 4,062,048
78 4,062,049

CLASS 361

6 4,062,051
28 4,062,052
119 4,062,053
4,062,054
160 4,062,055
172 4,062,056

CLASS 362

20 4,061,911
34 4,061,910
287 4,061,912
357 4,061,913

CLASS 363

22 4,061,957
71 4,062,057
81 4,061,958

CLASS 364

200 4,062,058
4,062,059
436 4,061,902
4,061,903
608 4,061,904
718 4,061,907
724 4,061,905
4,062,060
735 4,061,906
900 4,062,061

CLASS 365

16 4,062,003
27 4,062,002
49 4,062,001
182 4,061,999
203 4,062,000

CLASS 366

111 4,061,315
145 4,061,314
303 4,061,316
340 4,061,313

CLASS 401

216 4,061,430

CLASS 403

318 4,061,432
359 4,061,433

CLASS 404

4 4,061,434
10 4,061,435

CLASS 407

22 4,060,881
61 4,060,880

CLASS 408

3 4,061,436
42 4,061,437
143 4,061,438

CLASS 415

18 4,061,439

CLASS 416

157 R 4,061,440
175 4,061,441

CLASS 417

36 4,061,442
222 4,061,443
312 4,061,444

CLASS 418

54 4,061,445
133 4,061,446
142 4,061,447
170 4,061,448
226 4,061,449
253 4,061,450

CLASS 423

67 4,061,711
4,061,712
213.5 4,061,713
220 4,061,714
235 4,061,743
242 4,061,715
244 4,061,716
265 4,061,720
272 4,061,721
276 4,061,723
329 4,061,717
335 4,061,724
356 4,061,718
445 4,061,719
634 4,061,725
4,061,726
4,061,727

CLASS 424

14 4,061,728
59 4,061,730
101 4,061,731
117 4,061,732
143 4,061,733
155 4,061,734
177 4,061,735
4,061,736
4,061,737
195 4,061,738
4,061,739
202 4,061,740
232 4,061,741
234 4,061,742
243 4,061,744
244 4,061,745
4,061,746
4,061,747
246 4,061,748
4,061,749
249 4,061,750
250 4,061,751
4,061,752
253 4,061,753
258 4,061,754
263 4,061,755
4,061,756
4,061,757
4,061,758
4,061,759
267 4,061,760
270 4,061,761
4,061,762
273 R 4,061,722
274 4,061,763
275 4,061,764
278 4,061,765
279 4,061,766
282 4,061,767
283 4,061,768
4,061,769
304 4,061,770
4,061,771
4,061,772
4,061,791
305 4,061,729
313 4,061,773
325 4,061,774
330 4,061,775
4,061,776
4,061,777
4,061,778
331 4,061,779
358 4,061,780

CLASS 425

66 4,061,451
78 4,061,452
4,061,453
88 4,061,454
112 4,061,455
140 4,061,456
385 4,061,457
392 4,061,458
403 4,061,459
459 4,061,460
462 4,061,461
464 4,061,462

CLASS 426

60 4,061,781
86 4,061,782
87 4,061,783
93 4,061,784
124 4,061,785
138 4,061,786
140 4,061,787
248 4,061,788
250 4,061,789
303 4,061,790
330.2 4,061,792
433 4,061,793
486 4,061,794
535 4,061,795
4,061,796
590 4,061,797
607 4,061,798

CLASS 427

43 4,061,799
46 4,061,800
192 4,061,801
304 4,061,802
323 4,061,803

CLASS 428

17 4,061,804
31 4,061,805
35 4,061,806
36 4,061,807
42 4,061,808
50 4,061,809
85 4,061,810
95 4,061,811
117 4,061,812
183 4,061,813
196 4,061,814
215 4,061,815
218 4,061,816
246 4,061,817
4,061,818
294 4,061,819
304 4,061,821
311 4,061,820
315 4,061,822
318 4,061,823
328 4,061,824
355 4,061,825
356 4,061,826
368 4,061,827
403 4,061,828
451 4,061,829
469 4,061,830
480 4,061,831
500 4,061,832
511 4,061,833
522 4,061,834
4,061,835
537 4,061,836
609 4,061,837

CLASS 429

22 4,061,838
93 4,061,839
104 4,061,840
112 4,061,841
116 4,061,842
136 4,061,843

CLASS 431

9 4,061,463

CLASS 526

1 4,061,869
4 4,061,844
11.1 4,061,845
16 4,061,846
49 4,061,847
61 4,061,848
67 4,061,858
68 4,061,849
114 4,061,857
220 4,061,850

CLASS 536

88 4,061,859

CLASS 542

462 4,061,860

CLASS 544

16 4,061,630
21 4,061,851
27 4,061,852
4,061,862
30 4,061,853
4,061,861
53 4,061,631
60 4,061,632
88 4,061,854
106 4,061,633
122 4,061,855
158 4,061,634
172 4,061,635
193 4,061,856

CLASS 548

360 4,061,653

CLASS 560

18 4,061,863
26 4,061,662
4,061,864
53 4,061,666
121 4,061,865
4,061,866
219 4,061,867
246 4,061,868
261 4,061,667

CLASSIFICATION OF DESIGNS

D2— 320 246,551
406 246,552
D6— 8 246,553
71 246,554
75 246,555
79 246,556
130 246,557
191 246,558
D7— 47 246,559
76 246,560
246,561
78 246,562
150 246,563
154 246,564
189 246,565
194 246,566
D8— 26 246,567
40 246,568
45 246,569
98 246,570
330 246,571
354 246,572
384 246,573
D9— 67 246,574
14— 91 246,585
D10— 30 246,575
246,576
246,577
106 246,578
D11— 34 246,579
157 246,580
D13— 13 246,581
D14— 6 246,582
246,583
57 246,584
D15— 12 246,586
56 246,587
D16— 33 246,588
42 246,589
D19— 13 246,590
246,591
75 246,592
90 246,593
D22— 19 246,594
27 246,595
D23— 19 246,596
55 246,597
D24— 1.1 246,598
17 246,599
56 246,600
D25— 74 246,601
D27— 2 246,602
3 246,603
246,604
D28— 13 246,605
18 246,606
D31— 21.3 246,607
D34— 4 R 246,608
5 PP 246,611
5 SS 246,609
246,610
14 D 246,612
15 AJ 246,613
15 BB 246,614
D87— 1 R 246,615

CLASSIFICATION OF PLANTS

P.— 45 4,161
79 4,162

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[Notice of Dec. 16, 1969, 869 O.G. 6877]

210— 52 T965,001
252— 421 T965,002
427— 409 T965,003
526— 128 T965,004
542— 429 T965,005

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,060,948
4,061,512
2 : 4,061,197
4 : 4,061,058
4,061,107
4,061,216
4,061,232
4,061,460
4,061,885
5 : 4,060,852
4,060,926
6 : 4,060,858
4,060,868
4,060,891
4,060,897
4,060,930
4,060,931
4,060,936
4,060,938
4,060,986
4,060,991
4,061,017
4,061,020
4,061,022
4,061,029
4,061,040
4,061,065
4,061,071
4,061,083
4,061,089
4,061,102
4,061,122
4,061,132
4,061,134
4,061,161
4,061,173
4,061,206
4,061,244
4,061,255
4,061,257
4,061,302
4,061,340
4,061,342
4,061,348
4,061,351
4,061,352
4,061,354
4,061,366
4,061,367
4,061,370
4,061,372
4,061,375
4,061,376

4,061,391
4,061,400
4,061,415
4,061,427
4,061,437
4,061,441
4,061,480
4,061,518
4,061,520
4,061,522
4,061,530
4,061,561
4,061,574
4,061,579
4,061,592
4,061,599
4,061,605
4,061,736
4,061,793
4,061,800
4,061,812
4,061,815
4,061,834
4,061,837
4,061,872
4,061,877
4,061,880
4,061,882
4,061,887
4,061,898
4,061,901
4,061,909
4,061,912
4,061,925
4,061,926
4,061,927
4,061,930
4,061,931
4,061,974
4,061,977
4,061,978
4,061,986
4,061,989
4,061,995
4,062,002
4,062,003
4,062,041
4,062,048
4,062,049
8 : 4,060,907
4,060,956
4,061,115
4,061,267

4,061,396
4,061,425
4,062,006
9 : 4,060,885
4,060,979
4,060,980
4,061,006
4,061,025
4,061,026
4,061,044
4,061,068
4,061,247
4,061,292
4,061,344
4,061,439
4,061,597
4,061,622
4,061,623
4,061,703
4,061,867
4,061,876
4,062,004
10 : 4,061,168
4,061,590
4,061,685
4,061,715
11 : 4,061,658
12 : 4,060,867
4,060,876
4,060,896
4,060,946
4,060,962
4,061,123
4,061,130
4,061,154
4,061,196
4,061,235
4,061,251
4,061,256
4,061,385
4,061,483
4,061,577
4,061,797
4,061,809
4,061,897
13 : 4,061,096
4,061,133
4,061,249
16 : 4,061,031
4,061,094
17 : Re.29,486
4,060,855
4,060,872

4,060,898
4,060,908
4,060,929
4,060,959
4,061,012
4,061,038
4,061,064
4,061,069
4,061,073
4,061,079
4,061,092
4,061,099
4,061,101
4,061,135
4,061,136
4,061,138
4,061,139
4,061,150
4,061,188
4,061,194
4,061,203
4,061,237
4,061,241
4,061,243
4,061,272
4,061,277
4,061,281
4,061,309
4,061,315
4,061,321
4,061,335
4,061,394
4,061,445
4,061,455
4,061,463
4,061,470
4,061,478
4,061,521
4,061,563
4,061,582
4,061,589
4,061,591
4,061,610
4,061,611
4,061,648
4,061,689
4,061,695
4,061,698
4,061,711
4,061,712
4,061,764
4,061,787
4,061,817

4,061,835
4,061,884
4,061,896
4,061,911
4,061,973
4,061,988
4,062,047
4,062,053
4,062,055
18 : 4,061,093
4,061,183
4,061,187
4,061,201
4,061,353
4,061,384
4,061,524
4,061,541
4,061,607
4,061,626
4,061,630
4,061,738
4,061,755
4,061,861
4,061,936
4,061,981
4,062,007
19 : 4,060,960
4,061,021
4,061,074
4,061,167
4,061,284
4,061,576
4,061,902
20 : 4,060,921
4,060,961
4,061,015
4,061,457
4,061,722
4,061,753
4,061,847
21 : 4,060,862
4,061,082
4,061,373
4,061,961
22 : Re.29,488
4,060,894
4,061,125
4,061,242
4,061,322
4,061,465
4,061,634
23 : 4,061,128
24 : 4,060,904

4,060,940
4,061,042
4,061,114
4,061,129
4,061,202
4,061,259
4,061,338
4,061,409
4,061,412
4,061,426
4,061,662
4,061,731
4,061,864
4,061,893
4,061,979
4,062,052
25 : Re.29,487
4,060,854
4,060,861
4,060,902
4,060,915
4,060,933
4,061,050
4,061,158
4,061,286
4,061,314
4,061,326
4,061,395
4,061,423
4,061,566
4,061,573
4,061,578
4,061,588
4,061,654
4,061,682
4,061,836
4,061,890
4,061,900
4,061,944
4,061,946
26 : 4,060,859
4,060,878
4,060,910
4,060,935
4,060,997
4,061,002
4,061,014
4,061,034
4,061,070
4,061,076
4,061,077
4,061,121

4,061,124
4,061,165
4,061,218
4,061,350
4,061,364
4,061,379
4,061,386
4,061,402
4,061,403
4,061,452
4,061,453
4,061,593
4,061,601
4,061,639
4,061,657
4,061,665
4,061,666
4,061,709
4,061,742
4,061,756
4,061,760
4,061,790
4,061,791
4,061,833
4,061,841
4,061,859
4,061,866
4,061,935
4,061,947
4,061,985
27 : 4,061,126
4,061,228
4,061,245
4,061,268
4,061,273
4,061,383
4,061,408
4,061,505
4,061,624
4,061,826
4,061,873
29 : 4,060,901
4,060,920
4,060,944
4,061,152
4,061,224
4,061,226
4,061,274
4,061,336
4,061,667
30 : 4,061,312
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DESIGN PATENTS

6 : 246,557
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55 : 246,552

PLANT PATENTS

12 : 4,161

36 : 4,162

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[Notice of Dec. 16, 1969, 869 O.G. 6877]

T965,005

37 : T965,001

39 : T965,002

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